Supplementary Material Table 1 – Global fit rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [the latter obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 4.4 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 16, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K). Quenching rate coefficients are also given.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{He}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{K}^{\Delta J}/\Gamma$ $(10^{-17}\ cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{He}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{K}^{\Delta J}$ $(10^{-10}\ cm^3s^{-1})$
−4	2.08 ± 0.15	2.47 ± 0.15	0.35 ± 0.04	9.16 ± 0.68	10.89 ± 0.66	1.56 ± 0.20
−3	1.57 ± 0.12	0.53 ± 0.05	0.45 ± 0.05	6.93 ± 0.54	2.32 ± 0.22	1.97 ± 0.22
−2	4.57 ± 0.31	4.51 ± 0.27	0.82 ± 0.09	20.13 ± 1.36	19.84 ± 1.18	3.61 ± 0.38
−1	2.33 ± 0.16	0.98 ± 0.08	1.11 ± 0.11	10.23 ± 0.72	4.29 ± 0.36	4.90 ± 0.46
0						
1	1.88 ± 0.15	0.91 ± 0.11	1.87 ± 0.16	8.25 ± 0.65	4.02 ± 0.51	8.24 ± 0.71
2	4.45 ± 0.28	4.57 ± 0.28	1.57 ± 0.15	19.57 ± 1.24	20.09 ± 1.22	6.91 ± 0.66
3	1.20 ± 0.09	0.76 ± 0.06	0.53 ± 0.06	5.27 ± 0.40	3.35 ± 0.28	2.35 ± 0.25
4	1.95 ± 0.14	2.62 ± 0.16	0.38 ± 0.05	8.59 ± 0.61	11.54 ± 0.71	1.66 ± 0.24
	k_{Ar}^{Q}/Γ $(10^{-18}\ cm^3)$	k_{He}^{Q}/Γ $(10^{-18}\ cm^3)$	k_{K}^{Q}/Γ $(10^{-17}\ cm^3)$	k_{Ar}^{Q} $(10^{-11}\ cm^3s^{-1})$	k_{He}^{Q} $(10^{-11}\ cm^3s^{-1})$	k_{K}^{Q} $(10^{-10}\ cm^3s^{-1})$
	28.1 ± 2.5	41.5 ± 3.4	26.9 ± 2.8	123.7 ± 11.0	182.6 ± 15.0	118.5 ± 12.5

Supplementary Material Table 2 – Global fit fraction of orientation destroyed $\left(f_p^{\Delta J}\right)$ for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 16, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K), and g'_p values obtained from Eq. 37.

ΔJ	$f_{Ar}^{\Delta J}$	$f_{He}^{\Delta J}$	$f_{K}^{\Delta J}$
−4	0.67 ± 0.04	0.61 ± 0.06	0.94 ± 0.04
−3	0.64 ± 0.06	0.00 ± 0.35	0.84 ± 0.06
−2	0.47 ± 0.04	0.26 ± 0.05	0.91 ± 0.02
−1	0.46 ± 0.05	0.26 ± 0.17	0.96 ± 0.01
1	0.37 ± 0.05	0.00 ± 0.21	0.94 ± 0.01
2	0.57 ± 0.02	0.25 ± 0.05	0.93 ± 0.01
3	0.62 ± 0.05	0.00 ± 0.28	0.90 ± 0.05
4	0.58 ± 0.05	0.11 ± 0.09	1.00 ± 0.13
	g'_{Ar} $(10^{-11}\ cm^3s^{-1})$	g'_{He} $(10^{-11}\ cm^3s^{-1})$	g'_{K} $(10^{-10}\ cm^3s^{-1})$
	3.89 (fixed)	0.56 (fixed)	6.23 (fixed)

Supplementary Material Table 3 – Separate buffer gas fit rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [the latter obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 4.4 \times 10^7$ s^{-1}] for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 16, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K). Quenching rate coefficients are also given.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}$ $cm^3)$	$k_{He}^{\Delta J}/\Gamma$ $(10^{-18}$ $cm^3)$	$k_{K}^{\Delta J}/\Gamma$ $(10^{-17}$ $cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}$ $cm^3s^{-1})$	$k_{He}^{\Delta J}$ $(10^{-11}$ $cm^3s^{-1})$	$k_{K}^{\Delta J}$ $(10^{-10}$ $cm^3s^{-1})$
−4	2.11 ± 0.17	2.52 ± 0.13	0.37 ± 0.05	9.28 ± 0.73	11.07 ± 0.59	1.64 ± 0.23
−3	1.59 ± 0.13	0.52 ± 0.05	0.48 ± 0.06	6.99 ± 0.57	2.31 ± 0.22	2.12 ± 0.27
−2	4.64 ± 0.34	4.59 ± 0.24	0.85 ± 0.10	20.43 ± 1.48	20.19 ± 1.07	3.75 ± 0.46
−1	2.37 ± 0.17	0.99 ± 0.08	1.14 ± 0.13	10.43 ± 0.77	4.38 ± 0.36	5.00 ± 0.58
0						
1	1.86 ± 0.15	0.90 ± 0.11	2.00 ± 0.21	8.18 ± 0.67	3.94 ± 0.50	8.80 ± 0.92
2	4.49 ± 0.30	4.62 ± 0.25	1.68 ± 0.19	19.74 ± 1.33	20.32 ± 1.10	7.37 ± 0.85
3	1.21 ± 0.10	0.77 ± 0.06	0.56 ± 0.07	5.32 ± 0.42	3.37 ± 0.26	2.49 ± 0.31
4	1.98 ± 0.15	2.67 ± 0.14	0.40 ± 0.06	8.71 ± 0.66	11.74 ± 0.63	1.75 ± 0.28
	k_{Ar}^{Q}/Γ $(10^{-18}$ $cm^3)$	k_{He}^{Q}/Γ $(10^{-18}$ $cm^3)$	k_{K}^{Q}/Γ $(10^{-17}$ $cm^3)$	k_{Ar}^{Q} $(10^{-11}$ $cm^3s^{-1})$	k_{He}^{Q} $(10^{-11}$ $cm^3s^{-1})$	k_{K}^{Q} $(10^{-10}$ $cm^3s^{-1})$
	28.4 ± 2.6	42.2 ± 3.3	28.4 ± 3.6	125.2 ± 11.6	185.6 ± 14.5	125.1 ± 15.9

Supplementary Material Table 4 – Separate buffer gas fit fraction of orientation destroyed $\left(f_p^{\Delta J}\right)$ for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 16, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K), and g'_p values obtained from Eq. 37.

ΔJ	$f_{Ar}^{\Delta J}$	$f_{He}^{\Delta J}$	$f_{K}^{\Delta J}$
−4	0.67 ± 0.04	0.60 ± 0.06	0.94 ± 0.04
−3	0.62 ± 0.06	0.00 ± 0.35	0.86 ± 0.06
−2	0.47 ± 0.04	0.25 ± 0.05	0.90 ± 0.02
−1	0.45 ± 0.05	0.26 ± 0.17	0.96 ± 0.01
1	0.35 ± 0.05	0.00 ± 0.21	0.94 ± 0.01
2	0.56 ± 0.03	0.24 ± 0.05	0.93 ± 0.01
3	0.60 ± 0.06	0.00 ± 0.28	0.91 ± 0.05
4	0.58 ± 0.05	0.10 ± 0.09	1.00 ± 0.13
	g'_{Ar} $(10^{-11}$ $cm^3s^{-1})$	g'_{He} $(10^{-11}$ $cm^3s^{-1})$	g'_{K} $(10^{-10}$ $cm^3s^{-1})$
	3.80 (fixed)	0.58 (fixed)	6.55 (fixed)

Supplementary Material Table 5 – Fluorescence and polarization fit rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [the latter obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 4.4 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 16, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K). Quenching rate coefficients are also given.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $\left(10^{-18}\ cm^3\right)$	$k_{He}^{\Delta J}/\Gamma$ $\left(10^{-18}\ cm^3\right)$	$k_{K}^{\Delta J}/\Gamma$ $\left(10^{-17}\ cm^3\right)$	$k_{Ar}^{\Delta J}$ $\left(10^{-11}\ cm^3s^{-1}\right)$	$k_{He}^{\Delta J}$ $\left(10^{-11}\ cm^3s^{-1}\right)$	$k_{K}^{\Delta J}$ $\left(10^{-10}\ cm^3s^{-1}\right)$
−4	2.00 ± 0.13	2.20 ± 0.11	0.21 ± 0.03	8.80 ± 0.58	9.69 ± 0.49	0.91 ± 0.14
−3	1.55 ± 0.11	0.50 ± 0.04	0.28 ± 0.04	6.80 ± 0.47	2.19 ± 0.18	1.22 ± 0.16
−2	4.44 ± 0.27	4.03 ± 0.20	0.49 ± 0.06	19.54 ± 1.18	17.72 ± 0.88	2.16 ± 0.27
−1	2.32 ± 0.15	0.97 ± 0.07	0.69 ± 0.08	10.22 ± 0.66	4.27 ± 0.29	3.03 ± 0.34
0						
1	1.97 ± 0.14	0.92 ± 0.09	1.23 ± 0.12	8.65 ± 0.62	4.06 ± 0.40	5.39 ± 0.53
2	4.41 ± 0.26	4.15 ± 0.21	0.97 ± 0.11	19.42 ± 1.12	18.27 ± 0.93	4.27 ± 0.49
3	1.18 ± 0.08	0.71 ± 0.05	0.34 ± 0.04	5.17 ± 0.35	3.11 ± 0.22	1.49 ± 0.19
4	1.85 ± 0.12	2.32 ± 0.12	0.22 ± 0.04	8.14 ± 0.51	10.21 ± 0.53	0.95 ± 0.17
	k_{Ar}^{Q}/Γ $\left(10^{-18}\ cm^3\right)$	k_{He}^{Q}/Γ $\left(10^{-18}\ cm^3\right)$	k_{K}^{Q}/Γ $\left(10^{-17}\ cm^3\right)$	k_{Ar}^{Q} $\left(10^{-11}\ cm^3s^{-1}\right)$	k_{He}^{Q} $\left(10^{-11}\ cm^3s^{-1}\right)$	k_{K}^{Q} $\left(10^{-10}\ cm^3s^{-1}\right)$
	29.5 ± 2.4	37.8 ± 2.6	14.8 ± 2.0	129.7 ± 10.4	166.1 ± 11.5	65.2 ± 8.7

Supplementary Material Table 6 – Fluorescence and polarization fit fraction of orientation destroyed $\left(f_p^{\Delta J}\right)$ for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 16, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K), and g'_p values obtained from Eq. 37.

ΔJ	$f_{Ar}^{\Delta J}$	$f_{He}^{\Delta J}$	$f_{K}^{\Delta J}$
−4	0.73 ± 0.03	0.62 ± 0.06	0.95 ± 0.05
−3	0.69 ± 0.04	0.00 ± 0.31	0.85 ± 0.06
−2	0.56 ± 0.02	0.28 ± 0.05	0.90 ± 0.02
−1	0.55 ± 0.03	0.33 ± 0.14	0.97 ± 0.01
1	0.48 ± 0.02	0.00 ± 0.15	0.95 ± 0.01
2	0.62 ± 0.01	0.31 ± 0.04	0.94 ± 0.02
3	0.65 ± 0.04	0.00 ± 0.23	0.93 ± 0.06
4	0.64 ± 0.04	0.15 ± 0.08	1.00 ± 0.15
	g'_{Ar} $\left(10^{-11}\ cm^3s^{-1}\right)$	g'_{He} $\left(10^{-11}\ cm^3s^{-1}\right)$	g'_{K} $\left(10^{-10}\ cm^3s^{-1}\right)$
	4.91 (fixed)	0.71 (fixed)	4.03 (fixed)

Supplementary Material Table 7 – Fully separated fit rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [the latter obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 4.4 \times 10^7$ s^{-1}] for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 16, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K). Quenching rate coefficients are also given.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $\left(10^{-18}\text{ cm}^3\right)$	$k_{He}^{\Delta J}/\Gamma$ $\left(10^{-18}\text{ cm}^3\right)$	$k_{K}^{\Delta J}/\Gamma$ $\left(10^{-17}\text{ cm}^3\right)$	$k_{Ar}^{\Delta J}$ $\left(10^{-11}\text{ cm}^3\text{s}^{-1}\right)$	$k_{He}^{\Delta J}$ $\left(10^{-11}\text{ cm}^3\text{s}^{-1}\right)$	$k_{K}^{\Delta J}$ $\left(10^{-10}\text{ cm}^3\text{s}^{-1}\right)$
−4	1.83 ± 0.11	2.09 ± 0.09	0.15 ± 0.03	8.05 ± 0.51	9.20 ± 0.38	0.67 ± 0.12
−3	1.43 ± 0.09	0.50 ± 0.03	0.20 ± 0.03	6.31 ± 0.41	2.20 ± 0.15	0.89 ± 0.15
−2	4.08 ± 0.23	3.84 ± 0.16	0.35 ± 0.06	17.97 ± 1.03	16.89 ± 0.69	1.55 ± 0.25
−1	2.17 ± 0.13	0.99 ± 0.06	0.48 ± 0.07	9.56 ± 0.58	4.36 ± 0.24	2.10 ± 0.32
0						
1	1.87 ± 0.12	0.98 ± 0.07	0.91 ± 0.12	8.24 ± 0.54	4.31 ± 0.32	4.02 ± 0.53
2	4.10 ± 0.23	3.97 ± 0.17	0.73 ± 0.11	18.06 ± 1.00	17.49 ± 0.75	3.20 ± 0.48
3	1.10 ± 0.07	0.70 ± 0.04	0.24 ± 0.04	4.82 ± 0.31	3.10 ± 0.18	1.07 ± 0.17
4	1.68 ± 0.10	2.20 ± 0.09	0.16 ± 0.03	7.40 ± 0.45	9.66 ± 0.41	0.69 ± 0.15
	k_{Ar}^{Q}/Γ $\left(10^{-18}\text{ cm}^3\right)$	k_{He}^{Q}/Γ $\left(10^{-18}\text{ cm}^3\right)$	k_{K}^{Q}/Γ $\left(10^{-17}\text{ cm}^3\right)$	k_{Ar}^{Q} $\left(10^{-11}\text{ cm}^3\text{s}^{-1}\right)$	k_{He}^{Q} $\left(10^{-11}\text{ cm}^3\text{s}^{-1}\right)$	k_{K}^{Q} $\left(10^{-10}\text{ cm}^3\text{s}^{-1}\right)$
	27.1 ± 2.1	36.4 ± 2.2	9.7 ± 1.9	119.3 ± 9.0	160.3 ± 9.6	42.7 ± 8.2

Supplementary Material Table 8 – Fully separated fit fraction of orientation destroyed $\left(f_p^{\Delta J}\right)$ for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 16, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K), and g_p' values obtained from Eq. 37.

ΔJ	$f_{Ar}^{\Delta J}$	$f_{He}^{\Delta J}$	$f_{K}^{\Delta J}$
−4	0.75 ± 0.03	0.62 ± 0.05	0.95 ± 0.06
−3	0.70 ± 0.04	0.00 ± 0.29	0.87 ± 0.07
−2	0.59 ± 0.02	0.30 ± 0.04	0.90 ± 0.02
−1	0.59 ± 0.03	0.38 ± 0.13	0.97 ± 0.01
1	0.53 ± 0.02	0.00 ± 0.12	0.96 ± 0.01
2	0.65 ± 0.01	0.34 ± 0.03	0.95 ± 0.02
3	0.66 ± 0.04	0.00 ± 0.21	0.98 ± 0.07
4	0.64 ± 0.03	0.18 ± 0.07	1.00 ± 0.17
	g_{Ar}' $\left(10^{-11}\text{ cm}^3\text{s}^{-1}\right)$	g_{He}' $\left(10^{-11}\text{ cm}^3\text{s}^{-1}\right)$	g_{K}' $\left(10^{-10}\text{ cm}^3\text{s}^{-1}\right)$
	4.97 (fixed)	0.82 (fixed)	2.94 (fixed)

Supplementary Material Table 9 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 4.7 \times 10^7$ s^{-1}] for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 0, J = 14)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K).

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}$ $cm^3)$	$k_{He}^{\Delta J}/\Gamma$ $(10^{-18}$ $cm^3)$	$k_{K}^{\Delta J}/\Gamma$ $(10^{-17}$ $cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}$ $cm^3s^{-1})$	$k_{He}^{\Delta J}$ $(10^{-11}$ $cm^3s^{-1})$	$k_{K}^{\Delta J}$ $(10^{-10}$ $cm^3s^{-1})$
−10	0.38 ± 0.09	1.13 ± 0.12	0.72 ± 0.63	1.81 ± 0.41	5.33 ± 0.54	3.39 ± 2.96
−9	0.19 ± 0.05	0.60 ± 0.10	1.40 ± 0.57	0.89 ± 0.22	2.80 ± 0.45	6.56 ± 2.67
−8	0.41 ± 0.06	1.49 ± 0.13	1.53 ± 0.61	1.94 ± 0.26	7.02 ± 0.60	7.20 ± 2.88
−7	0.42 ± 0.05	0.85 ± 0.10	1.24 ± 0.58	1.96 ± 0.25	3.99 ± 0.48	5.84 ± 2.71
−6	0.75 ± 0.07	2.12 ± 0.15	1.88 ± 0.75	3.51 ± 0.34	9.97 ± 0.71	8.85 ± 3.51
−5	0.57 ± 0.06	0.96 ± 0.11	1.83 ± 0.69	2.67 ± 0.30	4.51 ± 0.53	8.60 ± 3.25
−4	1.28 ± 0.10	3.12 ± 0.20	4.29 ± 0.87	6.01 ± 0.48	14.67 ± 0.95	20.17 ± 4.08
−3	0.79 ± 0.07	1.32 ± 0.12	2.89 ± 0.65	3.70 ± 0.33	6.23 ± 0.56	13.60 ± 3.04
−2	2.98 ± 0.21	5.11 ± 0.32	8.94 ± 1.67	14.00 ± 1.01	24.04 ± 1.52	42.03 ± 7.83
−1	1.09 ± 0.09	1.42 ± 0.13	3.33 ± 0.74	5.10 ± 0.41	6.66 ± 0.59	15.67 ± 3.47
0						
1	1.19 ± 0.09	1.59 ± 0.13	3.66 ± 0.79	5.61 ± 0.44	7.49 ± 0.63	17.18 ± 3.69
2	3.51 ± 0.25	5.97 ± 0.37	9.43 ± 1.84	16.50 ± 1.15	28.04 ± 1.73	44.30 ± 8.65
3	0.98 ± 0.08	1.54 ± 0.13	3.11 ± 0.70	4.60 ± 0.38	7.25 ± 0.60	14.62 ± 3.27
4	1.77 ± 0.13	4.30 ± 0.26	4.96 ± 1.03	8.31 ± 0.61	20.22 ± 1.23	23.31 ± 4.84
5	0.91 ± 0.08	1.68 ± 0.14	2.37 ± 0.84	4.30 ± 0.39	7.88 ± 0.65	11.12 ± 3.97
6	1.13 ± 0.10	3.52 ± 0.20	2.95 ± 0.98	5.33 ± 0.45	16.54 ± 0.96	13.85 ± 4.60
7	0.83 ± 0.08	1.76 ± 0.14	2.18 ± 0.80	3.89 ± 0.36	8.27 ± 0.65	10.24 ± 3.75
8	0.83 ± 0.08	3.14 ± 0.19	2.76 ± 0.88	3.92 ± 0.39	14.75 ± 0.89	12.95 ± 4.13
9	0.76 ± 0.07	1.69 ± 0.13	1.88 ± 0.74	3.59 ± 0.34	7.93 ± 0.63	8.85 ± 3.50
10	0.69 ± 0.07	2.78 ± 0.17	2.31 ± 0.79	3.24 ± 0.35	13.04 ± 0.82	10.87 ± 3.70
11	0.68 ± 0.07	1.71 ± 0.14	2.00 ± 0.74	3.18 ± 0.33	8.03 ± 0.64	9.40 ± 3.46
12	0.64 ± 0.07	2.61 ± 0.17	2.20 ± 0.76	3.00 ± 0.33	12.27 ± 0.78	10.33 ± 3.56
13	0.60 ± 0.07	1.64 ± 0.13	2.03 ± 0.72	2.84 ± 0.32	7.69 ± 0.62	9.53 ± 3.40
14	0.57 ± 0.06	2.31 ± 0.16	1.86 ± 0.70	2.67 ± 0.30	10.83 ± 0.73	8.75 ± 3.27
15	0.60 ± 0.07	1.62 ± 0.13	1.91 ± 0.71	2.83 ± 0.31	7.62 ± 0.62	8.97 ± 3.32
16	0.50 ± 0.07	2.15 ± 0.15	2.14 ± 0.72	2.36 ± 0.31	10.10 ± 0.70	10.08 ± 3.36

Supplementary Material Table 10 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 4.7 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 0, J = 30)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K).

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{He}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{K}^{\Delta J}/\Gamma$ $(10^{-17}\ cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{He}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{K}^{\Delta J}$ $(10^{-10}\ cm^3s^{-1})$
−20	0.26 ± 0.02	0.69 ± 0.15	0.50 ± 0.13	1.22 ± 0.11	3.24 ± 0.73	2.34 ± 0.60
−19	0.32 ± 0.03	0.84 ± 0.15	0.60 ± 0.14	1.50 ± 0.12	3.97 ± 0.71	2.81 ± 0.66
−18	0.32 ± 0.03	0.77 ± 0.16	0.65 ± 0.15	1.51 ± 0.13	3.62 ± 0.73	3.04 ± 0.69
−17	0.35 ± 0.03	0.84 ± 0.17	0.64 ± 0.15	1.62 ± 0.13	3.96 ± 0.80	2.99 ± 0.69
−16	0.37 ± 0.03	0.97 ± 0.16	0.10 ± 0.02	1.74 ± 0.14	4.55 ± 0.73	0.46 ± 0.07
−15	0.44 ± 0.03	1.21 ± 0.17	0.77 ± 0.17	2.08 ± 0.14	5.70 ± 0.80	3.63 ± 0.79
−14	0.46 ± 0.03	1.06 ± 0.16	0.94 ± 0.19	2.16 ± 0.16	4.96 ± 0.75	4.44 ± 0.89
−13	0.49 ± 0.03	1.19 ± 0.17	0.86 ± 0.18	2.32 ± 0.15	5.57 ± 0.79	4.05 ± 0.85
−12	0.53 ± 0.04	1.20 ± 0.17	1.13 ± 0.21	2.50 ± 0.17	5.65 ± 0.78	5.32 ± 1.00
−11	0.56 ± 0.04	1.28 ± 0.17	1.00 ± 0.20	2.64 ± 0.17	6.02 ± 0.80	4.69 ± 0.93
−10	0.67 ± 0.04	1.49 ± 0.18	1.30 ± 0.24	3.15 ± 0.19	7.02 ± 0.85	6.12 ± 1.15
−9	0.69 ± 0.04	1.53 ± 0.18	1.08 ± 0.22	3.25 ± 0.18	7.20 ± 0.87	5.08 ± 1.02
−8	0.83 ± 0.05	1.67 ± 0.19	1.83 ± 0.30	3.92 ± 0.23	7.86 ± 0.88	8.60 ± 1.42
−7	0.70 ± 0.04	1.72 ± 0.19	1.45 ± 0.25	3.29 ± 0.20	8.09 ± 0.90	6.80 ± 1.16
−6	1.12 ± 0.06	1.98 ± 0.20	2.42 ± 0.37	5.27 ± 0.28	9.32 ± 0.94	11.36 ± 1.76
−5	0.96 ± 0.05	1.96 ± 0.20	1.49 ± 0.27	4.50 ± 0.22	9.19 ± 0.96	6.98 ± 1.28
−4	1.76 ± 0.11	3.00 ± 0.23	3.82 ± 0.75	8.26 ± 0.52	14.10 ± 1.08	17.97 ± 3.53
−3	1.14 ± 0.07	2.19 ± 0.19	1.83 ± 0.41	5.37 ± 0.31	10.29 ± 0.89	8.59 ± 1.93
−2	3.44 ± 0.20	4.89 ± 0.34	6.58 ± 1.35	16.15 ± 0.95	23.00 ± 1.62	30.94 ± 6.32
−1	1.52 ± 0.08	2.95 ± 0.23	2.10 ± 0.50	7.15 ± 0.38	13.88 ± 1.08	9.85 ± 2.33
0						
1	1.41 ± 0.08	2.50 ± 0.20	2.20 ± 0.50	6.63 ± 0.37	11.75 ± 0.96	10.35 ± 2.33
2	3.58 ± 0.21	5.35 ± 0.37	7.02 ± 1.42	16.85 ± 1.00	25.16 ± 1.74	33.01 ± 6.68
3	1.23 ± 0.07	2.56 ± 0.21	1.95 ± 0.44	5.77 ± 0.33	12.04 ± 0.98	9.19 ± 2.06
4	1.84 ± 0.12	3.10 ± 0.24	4.09 ± 0.80	8.65 ± 0.55	14.55 ± 1.11	19.23 ± 3.75
5	1.07 ± 0.05	2.25 ± 0.22	1.71 ± 0.30	5.01 ± 0.24	10.57 ± 1.02	8.02 ± 1.41
6	1.33 ± 0.07	2.74 ± 0.24	2.79 ± 0.43	6.27 ± 0.32	12.87 ± 1.12	13.09 ± 2.04
7	0.97 ± 0.05	2.12 ± 0.21	1.56 ± 0.28	4.55 ± 0.23	9.98 ± 1.00	7.33 ± 1.32
8	1.03 ± 0.06	2.27 ± 0.22	2.06 ± 0.35	4.84 ± 0.26	10.66 ± 1.02	9.70 ± 1.64
9	0.85 ± 0.05	2.06 ± 0.21	1.43 ± 0.26	4.00 ± 0.21	9.66 ± 0.99	6.72 ± 1.23
10	0.87 ± 0.05	2.10 ± 0.21	1.70 ± 0.30	4.08 ± 0.23	9.86 ± 0.99	8.01 ± 1.41

Supplementary Material Table 11 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 4.7 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 1, J = 26)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K).

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $\left(10^{-18}\ cm^3\right)$	$k_{He}^{\Delta J}/\Gamma$ $\left(10^{-18}\ cm^3\right)$	$k_{K}^{\Delta J}/\Gamma$ $\left(10^{-17}\ cm^3\right)$	$k_{Ar}^{\Delta J}$ $\left(10^{-11}\ cm^3s^{-1}\right)$	$k_{He}^{\Delta J}$ $\left(10^{-11}\ cm^3s^{-1}\right)$	$k_{K}^{\Delta J}$ $\left(10^{-10}\ cm^3s^{-1}\right)$
−17	0.20 ± 0.06	0.45 ± 0.07	0.49 ± 0.36	0.93 ± 0.26	2.11 ± 0.33	2.32 ± 1.68
−16	0.24 ± 0.06	0.81 ± 0.10	0.43 ± 0.36	1.13 ± 0.27	3.79 ± 0.46	2.00 ± 1.68
−15	0.27 ± 0.04	0.49 ± 0.05	0.39 ± 0.26	1.27 ± 0.20	2.32 ± 0.25	1.81 ± 1.24
−14	0.34 ± 0.05	1.02 ± 0.08	0.59 ± 0.31	1.59 ± 0.23	4.80 ± 0.38	2.78 ± 1.46
−13	0.28 ± 0.04	0.60 ± 0.05	0.58 ± 0.25	1.32 ± 0.19	2.80 ± 0.24	2.74 ± 1.20
−12	0.37 ± 0.04	1.13 ± 0.07	0.70 ± 0.26	1.75 ± 0.19	5.30 ± 0.31	3.28 ± 1.21
−11	0.37 ± 0.04	0.79 ± 0.05	0.78 ± 0.26	1.76 ± 0.19	3.70 ± 0.25	3.66 ± 1.24
−10	0.46 ± 0.05	1.49 ± 0.08	1.07 ± 0.31	2.16 ± 0.21	7.00 ± 0.37	5.04 ± 1.47
−9	0.48 ± 0.05	0.81 ± 0.06	1.03 ± 0.31	2.27 ± 0.21	3.82 ± 0.28	4.82 ± 1.47
−8	0.66 ± 0.06	1.84 ± 0.09	1.47 ± 0.41	3.09 ± 0.27	8.65 ± 0.43	6.89 ± 1.95
−7	0.55 ± 0.05	0.93 ± 0.06	1.33 ± 0.35	2.58 ± 0.23	4.35 ± 0.28	6.25 ± 1.65
−6	0.86 ± 0.07	2.40 ± 0.11	2.52 ± 0.52	4.06 ± 0.32	11.26 ± 0.51	11.83 ± 2.46
−5	0.72 ± 0.06	0.90 ± 0.06	1.27 ± 0.42	3.36 ± 0.28	4.23 ± 0.28	5.96 ± 1.98
−4	1.41 ± 0.10	3.21 ± 0.18	3.81 ± 0.69	6.61 ± 0.46	15.10 ± 0.85	17.89 ± 3.23
−3	0.88 ± 0.06	1.11 ± 0.07	1.60 ± 0.39	4.12 ± 0.28	5.24 ± 0.33	7.50 ± 1.81
−2	3.13 ± 0.20	5.13 ± 0.29	7.30 ± 1.36	14.69 ± 0.92	24.13 ± 1.37	34.31 ± 6.40
−1	1.17 ± 0.07	1.23 ± 0.08	1.51 ± 0.47	5.52 ± 0.34	5.78 ± 0.36	7.11 ± 2.20
0						
1	1.15 ± 0.08	1.26 ± 0.08	2.14 ± 0.49	5.42 ± 0.35	5.91 ± 0.37	10.07 ± 2.32
2	3.17 ± 0.20	5.28 ± 0.30	7.48 ± 1.39	14.90 ± 0.94	24.82 ± 1.41	35.17 ± 6.52
3	0.95 ± 0.06	1.19 ± 0.07	1.49 ± 0.40	4.46 ± 0.29	5.58 ± 0.35	7.00 ± 1.86
4	1.46 ± 0.10	3.53 ± 0.20	4.00 ± 0.72	6.88 ± 0.47	16.58 ± 0.93	18.81 ± 3.37
5	0.74 ± 0.05	1.14 ± 0.07	1.25 ± 0.38	3.50 ± 0.25	5.35 ± 0.31	5.89 ± 1.77
6	0.34 ± 0.04	1.02 ± 0.06	0.87 ± 0.27	1.60 ± 0.19	4.78 ± 0.29	4.10 ± 1.29
7	0.62 ± 0.05	1.17 ± 0.07	1.29 ± 0.36	2.89 ± 0.24	5.49 ± 0.32	6.07 ± 1.70
8	0.62 ± 0.05	1.59 ± 0.08	1.20 ± 0.36	2.91 ± 0.24	7.46 ± 0.40	5.64 ± 1.71
9	0.53 ± 0.05	1.04 ± 0.06	0.86 ± 0.30	2.48 ± 0.21	4.89 ± 0.29	4.06 ± 1.42
10	0.48 ± 0.05	1.32 ± 0.09	0.87 ± 0.35	2.25 ± 0.25	6.18 ± 0.41	4.11 ± 1.66
11	0.44 ± 0.05	0.91 ± 0.06	0.62 ± 0.30	2.08 ± 0.22	4.26 ± 0.30	2.90 ± 1.41
12	0.34 ± 0.05	1.28 ± 0.09	0.84 ± 0.35	1.60 ± 0.24	6.03 ± 0.44	3.96 ± 1.63
13	0.26 ± 0.04	0.67 ± 0.06	0.50 ± 0.28	1.24 ± 0.21	3.13 ± 0.29	2.35 ± 1.30
14	0.18 ± 0.04	0.60 ± 0.06	0.20 ± 0.23	0.86 ± 0.18	2.80 ± 0.28	0.95 ± 1.06
15	0.20 ± 0.04	0.51 ± 0.05	0.39 ± 0.24	0.94 ± 0.19	2.41 ± 0.26	1.84 ± 1.14
16	0.26 ± 0.04	0.84 ± 0.07	0.37 ± 0.26	1.21 ± 0.20	3.97 ± 0.34	1.75 ± 1.21
17	0.24 ± 0.04	0.56 ± 0.06	0.36 ± 0.25	1.13 ± 0.19	2.65 ± 0.27	1.70 ± 1.16
18	0.20 ± 0.04	0.70 ± 0.06	0.52 ± 0.26	0.93 ± 0.19	3.28 ± 0.30	2.46 ± 1.23
19	0.19 ± 0.04	0.49 ± 0.05	0.39 ± 0.24	0.88 ± 0.18	2.29 ± 0.25	1.83 ± 1.12
20	0.15 ± 0.04	0.44 ± 0.05	0.28 ± 0.21	0.70 ± 0.17	2.05 ± 0.24	1.33 ± 0.98
21	0.17 ± 0.06	0.38 ± 0.07	0.26 ± 0.31	0.78 ± 0.26	1.79 ± 0.32	1.22 ± 1.46
22	0.16 ± 0.05	0.47 ± 0.08	0.43 ± 0.34	0.76 ± 0.26	2.23 ± 0.35	2.00 ± 1.59
23	0.20 ± 0.06	0.46 ± 0.07	0.39 ± 0.34	0.93 ± 0.26	2.16 ± 0.35	1.83 ± 1.61

Supplementary Material Table 12 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 4.7 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 2, J = 44)$ molecules with argon, helium, and potassium atoms ($p = Ar$, He, and K).

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{He}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{K}^{\Delta J}/\Gamma$ $(10^{-17}\ cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{He}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{K}^{\Delta J}$ $(10^{-10}\ cm^3s^{-1})$
−17	0.20 ± 0.04	0.40 ± 0.05	0.11 ± 0.22	0.93 ± 0.18	1.86 ± 0.21	0.50 ± 1.03
−16	0.16 ± 0.04	0.38 ± 0.05	0.07 ± 0.22	0.73 ± 0.19	1.81 ± 0.21	0.33 ± 1.04
−15	0.18 ± 0.05	0.32 ± 0.04	0.00 ± 0.24	0.85 ± 0.22	1.50 ± 0.20	0.00 ± 1.14
−14	0.23 ± 0.05	0.60 ± 0.06	0.23 ± 0.27	1.09 ± 0.23	2.81 ± 0.30	1.06 ± 1.29
−13	0.27 ± 0.04	0.50 ± 0.05	0.27 ± 0.24	1.28 ± 0.20	2.34 ± 0.23	1.28 ± 1.11
−12	0.35 ± 0.04	1.01 ± 0.07	0.52 ± 0.26	1.65 ± 0.21	4.73 ± 0.31	2.44 ± 1.21
−11	0.40 ± 0.05	0.69 ± 0.06	0.42 ± 0.27	1.90 ± 0.22	3.23 ± 0.26	1.96 ± 1.28
−10	0.48 ± 0.05	1.45 ± 0.08	0.75 ± 0.30	2.27 ± 0.23	6.79 ± 0.39	3.55 ± 1.39
−9	0.50 ± 0.06	0.78 ± 0.07	0.56 ± 0.34	2.36 ± 0.26	3.66 ± 0.31	2.63 ± 1.59
−8	0.68 ± 0.06	1.84 ± 0.11	0.81 ± 0.40	3.21 ± 0.30	8.67 ± 0.52	3.81 ± 1.87
−7	0.64 ± 0.06	0.93 ± 0.07	0.50 ± 0.35	3.03 ± 0.27	4.38 ± 0.31	2.37 ± 1.65
−6	0.88 ± 0.07	2.35 ± 0.11	1.80 ± 0.44	4.14 ± 0.31	11.03 ± 0.53	8.44 ± 2.07
−5	0.81 ± 0.06	1.05 ± 0.07	0.75 ± 0.39	3.83 ± 0.29	4.95 ± 0.32	3.51 ± 1.85
−4	1.40 ± 0.10	3.12 ± 0.18	3.01 ± 0.65	6.58 ± 0.46	14.68 ± 0.84	14.16 ± 3.04
−3	1.03 ± 0.07	1.06 ± 0.07	0.83 ± 0.44	4.83 ± 0.34	4.99 ± 0.33	3.89 ± 2.09
−2	2.98 ± 0.20	5.04 ± 0.29	6.29 ± 1.30	14.03 ± 0.92	23.70 ± 1.36	29.57 ± 6.12
−1	1.10 ± 0.08	1.11 ± 0.07	0.92 ± 0.47	5.15 ± 0.36	5.19 ± 0.34	4.33 ± 2.19
0						
1	1.29 ± 0.09	1.14 ± 0.08	1.02 ± 0.53	6.04 ± 0.41	5.34 ± 0.35	4.79 ± 2.51
2	2.94 ± 0.19	5.22 ± 0.30	6.40 ± 1.30	13.83 ± 0.91	24.56 ± 1.40	30.08 ± 6.09
3	1.03 ± 0.07	1.06 ± 0.07	0.87 ± 0.44	4.84 ± 0.35	4.98 ± 0.33	4.10 ± 2.09
4	1.42 ± 0.10	3.32 ± 0.19	3.15 ± 0.66	6.68 ± 0.47	15.59 ± 0.89	14.80 ± 3.11
5	0.83 ± 0.06	1.02 ± 0.07	0.76 ± 0.40	3.89 ± 0.30	4.78 ± 0.32	3.58 ± 1.86
6	0.90 ± 0.08	2.48 ± 0.14	1.83 ± 0.52	4.21 ± 0.37	11.65 ± 0.65	8.59 ± 2.45
7	0.66 ± 0.07	0.96 ± 0.08	0.70 ± 0.41	3.10 ± 0.31	4.52 ± 0.36	3.29 ± 1.91
8	0.73 ± 0.08	2.07 ± 0.15	1.12 ± 0.51	3.42 ± 0.39	9.73 ± 0.70	5.26 ± 2.41
9	0.53 ± 0.07	0.85 ± 0.09	0.68 ± 0.43	2.48 ± 0.34	4.01 ± 0.40	3.21 ± 2.04
10	0.54 ± 0.07	1.59 ± 0.12	0.76 ± 0.44	2.54 ± 0.34	7.48 ± 0.58	3.55 ± 2.06
11	0.45 ± 0.07	0.77 ± 0.08	0.53 ± 0.41	2.12 ± 0.32	3.64 ± 0.39	2.51 ± 1.90
12	0.50 ± 0.07	1.50 ± 0.12	0.72 ± 0.42	2.33 ± 0.33	7.04 ± 0.56	3.36 ± 1.98
13	0.42 ± 0.07	0.76 ± 0.08	0.42 ± 0.40	1.99 ± 0.32	3.56 ± 0.38	1.97 ± 1.86
14	0.38 ± 0.07	1.13 ± 0.10	0.55 ± 0.38	1.79 ± 0.31	5.32 ± 0.48	2.59 ± 1.78
15	0.41 ± 0.09	0.78 ± 0.11	0.38 ± 0.51	1.90 ± 0.40	3.69 ± 0.51	1.80 ± 2.40
16	0.32 ± 0.08	0.91 ± 0.12	0.34 ± 0.45	1.48 ± 0.37	4.26 ± 0.56	1.61 ± 2.13

Supplementary Material Table 13 – Rate coefficients, $k_{Ar}^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 0, J = 14)$ molecules with argon atoms, corrected for multiple collision effects (using $n_{Ar} = 2.13\times10^{17}$ cm^{-3} and $n_K = 2.12\times10^{15}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 99th and 100th iteration values.

ΔJ	$k_{Ar}^{D\to C(0)}$	$k_{Ar}^{D\to C(n)}$ for iteration n (in units of 10^{-11} cm^{3}s^{-1}								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−10	1.81	1.03	1.07	1.20	1.14	1.19	1.15	1.17	1.17	1.17
−9	0.89	0.32	0.03	0.14	0.06	0.12	0.07	0.09	0.09	0.09
−8	1.94	0.84	0.45	0.54	0.44	0.52	0.45	0.48	0.48	0.48
−7	1.96	0.88	0.65	0.83	0.71	0.81	0.73	0.77	0.77	0.77
−6	3.51	1.75	1.40	1.53	1.42	1.53	1.44	1.48	1.48	1.48
−5	2.67	1.19	0.79	0.98	0.82	0.95	0.84	0.89	0.89	0.89
−4	6.01	3.36	2.97	3.03	2.88	3.01	2.89	2.94	2.94	2.94
−3	3.70	1.73	1.30	1.50	1.32	1.48	1.33	1.40	1.40	1.40
−2	14.00	10.75	11.58	11.80	11.64	11.80	11.66	11.72	11.72	11.72
−1	5.10	2.61	2.33	2.58	2.35	2.56	2.37	2.46	2.46	2.46
0										
1	5.61	2.87	2.62	2.93	2.66	2.91	2.69	2.79	2.79	2.79
2	16.50	12.56	13.63	13.94	13.70	13.94	13.72	13.82	13.82	13.82
3	4.60	2.03	1.37	1.70	1.37	1.67	1.40	1.53	1.53	1.53
4	8.31	4.53	4.08	4.30	3.96	4.26	3.98	4.11	4.11	4.11
5	4.30	1.83	1.22	1.65	1.28	1.62	1.31	1.46	1.46	1.46
6	5.33	2.39	1.66	2.05	1.67	2.02	1.70	1.86	1.86	1.86
7	3.89	1.59	0.98	1.46	1.06	1.43	1.09	1.25	1.25	1.25
8	3.92	1.57	0.81	1.30	0.89	1.27	0.93	1.09	1.09	1.09
9	3.59	1.44	0.87	1.36	0.93	1.32	0.97	1.13	1.13	1.13
10	3.24	1.22	0.50	0.99	0.57	0.96	0.60	0.77	0.77	0.77
11	3.18	1.25	0.68	1.14	0.72	1.10	0.75	0.92	0.92	0.92
12	3.00	1.16	0.60	1.07	0.66	1.04	0.69	0.86	0.86	0.86
13	2.84	1.11	0.59	0.97	0.57	0.93	0.60	0.76	0.76	0.76
14	2.67	1.04	0.57	0.95	0.56	0.91	0.59	0.74	0.74	0.74
15	2.83	1.29	1.21	1.59	1.27	1.57	1.30	1.43	1.43	1.43
16	2.36	1.01	0.86	1.21	0.90	1.19	0.93	1.06	1.06	1.06

Supplementary Material Table 14 – Rate coefficients, $k_{He}^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v =$ $0, J = 14)$ molecules with helium atoms, corrected for multiple collision effects (using $n_{He} = 2.95\times10^{17}$ cm^{-3} and $n_K = 3.02\times10^{15}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 5th and 6th iteration values.

ΔJ	$k_{He}^{D\to C(0)}$	$k_{He}^{D\to C(n)}$ for iteration n (in units of 10^{-11} cm^{3}s^{-1}								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−10	5.33	2.81	2.82	2.96	2.86	3.03	2.81	3.78	2.08	2.92
−9	2.80	1.13	0.84	1.11	0.88	1.14	0.83	1.92	0.00	0.99
−8	7.02	3.41	2.96	2.99	2.81	3.07	2.73	4.17	1.66	2.90
−7	3.99	1.62	1.18	1.55	1.20	1.60	1.13	2.63	0.00	1.37
−6	9.97	5.00	4.52	4.54	4.27	4.65	4.17	6.11	2.73	4.41
−5	4.51	1.65	0.74	1.17	0.66	1.21	0.57	2.70	0.00	0.89
−4	14.67	8.04	8.02	8.04	7.66	8.17	7.53	9.99	5.71	7.85
−3	6.23	2.50	1.87	2.54	1.90	2.63	1.78	4.21	0.00	2.20
−2	24.04	15.82	17.65	17.99	17.52	18.17	17.37	20.31	15.21	17.77
−1	6.66	2.50	1.45	2.24	1.40	2.33	1.24	4.34	0.00	1.78
0										
1	7.49	2.79	1.73	2.77	1.75	2.90	1.56	5.06	0.00	2.23
2	28.04	17.80	20.08	20.76	19.97	21.02	19.73	24.00	16.55	20.37
3	7.25	2.44	0.78	1.96	0.72	2.11	0.49	4.68	0.00	1.30
4	20.22	10.21	10.10	10.66	9.62	10.92	9.33	14.45	5.47	10.12
5	7.88	2.65	0.98	2.37	0.95	2.56	0.68	5.31	0.00	1.62
6	16.54	7.24	6.05	6.82	5.59	7.13	5.26	11.09	0.86	6.19
7	8.27	2.80	1.21	2.74	1.19	2.96	0.89	5.83	0.00	1.93
8	14.75	6.10	4.75	5.79	4.47	6.15	4.12	10.24	0.00	5.14
9	7.93	2.59	0.81	2.31	0.66	2.53	0.35	5.53	0.00	1.44
10	13.04	5.09	3.47	4.59	3.17	4.93	2.81	9.15	0.00	3.87
11	8.03	2.71	1.22	2.73	1.06	2.96	0.75	5.83	0.00	1.85
12	12.27	4.80	3.47	4.63	3.18	4.95	2.81	8.97	0.00	3.88
13	7.69	2.63	1.34	2.70	1.05	2.89	0.75	5.78	0.00	1.82
14	10.83	4.16	2.94	4.00	2.56	4.27	2.21	8.09	0.00	3.24
15	7.62	2.88	2.51	3.91	2.47	4.14	2.20	6.48	0.00	3.17
16	10.10	4.20	3.99	5.18	3.92	5.47	3.62	8.51	0.00	4.54

Supplementary Material Table 15 – Rate coefficients, $k_K^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 0, J = 14)$ molecules with potassium atoms, corrected for multiple collision effects (using $n_{Ar} = 2.13\times10^{17}$ cm^{-3} and $n_K = 2.12\times10^{15}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 99th and 100th iteration values.

ΔJ	$k_K^{D\to C(0)}$	$k_K^{D\to C(n)}$ for iteration n (in units of 10^{-10} cm^{3}s^{-1})								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−10	3.39	1.45	0.86	1.13	0.97	1.10	0.98	1.04	1.04	1.04
−9	6.56	3.77	3.96	4.37	4.17	4.35	4.20	4.27	4.27	4.27
−8	7.20	3.56	2.95	3.36	3.12	3.34	3.15	3.24	3.24	3.24
−7	5.84	2.46	1.33	1.67	1.35	1.61	1.38	1.48	1.48	1.48
−6	8.85	3.92	2.11	2.35	2.02	2.31	2.05	2.17	2.17	2.17
−5	8.60	3.85	2.57	3.04	2.63	2.99	2.67	2.82	2.82	2.82
−4	20.17	11.90	11.28	11.54	11.12	11.49	11.15	11.31	11.31	11.31
−3	13.60	7.01	6.33	6.95	6.45	6.91	6.50	6.70	6.70	6.70
−2	42.03	32.18	34.72	35.31	34.85	35.29	34.90	35.08	35.08	35.08
−1	15.67	8.03	7.16	7.79	7.14	7.70	7.19	7.43	7.43	7.43
0										
1	17.18	8.90	8.27	9.14	8.38	9.07	8.45	8.74	8.74	8.74
2	44.30	32.84	35.69	36.58	35.87	36.54	35.93	36.22	36.22	36.22
3	14.62	6.75	5.27	6.30	5.37	6.20	5.45	5.81	5.81	5.81
4	23.31	12.57	11.40	12.10	11.15	11.99	11.22	11.59	11.59	11.59
5	11.12	4.38	2.03	3.28	2.21	3.16	2.30	2.71	2.71	2.71
6	13.85	5.78	3.09	4.11	3.02	4.01	3.11	3.54	3.54	3.54
7	10.24	3.93	1.78	3.25	2.09	3.14	2.19	2.64	2.64	2.64
8	12.95	5.56	3.98	5.43	4.31	5.37	4.41	4.87	4.87	4.87
9	8.85	3.18	0.87	2.30	1.09	2.17	1.19	1.66	1.66	1.66
10	10.87	4.39	2.67	4.00	2.82	3.90	2.91	3.38	3.38	3.38
11	9.40	3.67	2.00	3.32	2.14	3.22	2.24	2.71	2.71	2.71
12	10.33	4.29	2.98	4.19	3.05	4.11	3.15	3.61	3.61	3.61
13	9.53	4.00	2.88	3.96	2.84	3.85	2.93	3.37	3.37	3.37
14	8.75	3.54	2.18	3.08	2.01	2.98	2.08	2.51	2.51	2.51
15	8.97	4.20	4.10	5.12	4.20	5.06	4.28	4.65	4.65	4.65
16	10.08	5.22	5.64	6.62	5.78	6.59	5.85	6.20	6.20	6.20

Supplementary Material Table 16 – Rate coefficients, $k_{Ar}^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 0, J = 30)$ molecules with argon atoms, corrected for multiple collision effects (using $n_{Ar} = 2.13\times10^{17}$ cm^{-3} and $n_K = 2.12\times10^{15}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 5th and 6th iteration values.

ΔJ	$k_{Ar}^{D\to C(0)}$	$k_{Ar}^{D\to C(n)}$ for iteration n (in units of 10^{-11} cm^{3}s^{-1}								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−20	1.22	0.45	0.36	0.62	0.32	0.65	0.28	0.96	0.00	0.47
−19	1.50	0.59	0.53	0.83	0.51	0.87	0.47	1.20	0.00	0.67
−18	1.51	0.53	0.30	0.61	0.24	0.66	0.19	1.07	0.00	0.43
−17	1.62	0.55	0.22	0.54	0.13	0.58	0.08	1.07	0.00	0.33
−16	1.74	0.58	0.18	0.55	0.11	0.60	0.05	1.11	0.00	0.33
−15	2.08	0.74	0.42	0.83	0.37	0.89	0.32	1.40	0.00	0.60
−14	2.16	0.74	0.34	0.80	0.31	0.86	0.25	1.42	0.00	0.56
−13	2.32	0.79	0.33	0.79	0.28	0.85	0.22	1.48	0.00	0.53
−12	2.50	0.85	0.29	0.78	0.25	0.84	0.19	1.54	0.00	0.51
−11	2.64	0.90	0.32	0.83	0.28	0.88	0.21	1.62	0.00	0.55
−10	3.15	1.13	0.53	1.06	0.51	1.12	0.44	1.91	0.00	0.78
−9	3.25	1.19	0.67	1.24	0.69	1.30	0.62	2.06	0.00	0.96
−8	3.92	1.50	0.87	1.38	0.84	1.44	0.77	2.30	0.00	1.11
−7	3.29	1.12	0.28	0.79	0.24	0.84	0.18	1.80	0.00	0.51
−6	5.27	2.22	1.60	2.01	1.50	2.08	1.44	3.00	0.39	1.76
−5	4.50	1.79	1.21	1.72	1.22	1.78	1.16	2.69	0.08	1.47
−4	8.26	4.20	3.94	4.20	3.72	4.24	3.66	5.21	2.64	3.95
−3	5.37	2.26	1.63	2.02	1.55	2.06	1.49	3.06	0.43	1.77
−2	16.15	11.30	12.64	13.02	12.64	13.08	12.58	14.00	11.64	12.83
−1	7.15	3.53	3.42	3.82	3.42	3.87	3.37	4.87	2.35	3.62
0										
1	6.63	3.10	2.70	2.99	2.63	3.03	2.58	4.01	1.63	2.81
2	16.85	12.00	13.32	13.62	13.36	13.69	13.32	14.53	12.50	13.51
3	5.77	2.56	1.99	2.27	1.97	2.31	1.93	3.22	1.05	2.12
4	8.65	4.50	4.03	4.08	3.81	4.10	3.77	4.93	2.98	3.93
5	5.01	2.16	1.52	1.75	1.51	1.78	1.47	2.60	0.69	1.63
6	6.27	2.98	2.44	2.58	2.39	2.63	2.36	3.36	1.66	2.50
7	4.55	2.04	1.58	1.78	1.58	1.79	1.55	2.47	0.90	1.67
8	4.84	2.23	1.73	1.84	1.67	1.85	1.65	2.44	1.06	1.75
9	4.00	1.98	1.90	2.12	1.98	2.13	1.96	2.63	1.46	2.04
10	4.08	2.11	2.08	2.27	2.17	2.30	2.15	2.73	1.73	2.23

Supplementary Mateial Table 17 – Rate coefficients, $k_{He}^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v =$ $0, J = 30)$ molecules with helium atoms, corrected for multiple collision effects (using $n_{He} = 2.95\times10^{17}$ cm^{-3} and $n_K = 3.02\times10^{15}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 5th and 6th iteration values.

ΔJ	$k_{He}^{D\to C(0)}$	$k_{He}^{D\to C(n)}$ for iteration n (in units of 10^{-11} cm^{3}s^{-1}								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−20	3.24	1.12	0.97	1.65	0.78	1.92	0.40	3.04	0.00	1.16
−19	3.97	1.46	1.46	2.22	1.30	2.52	0.90	3.75	0.00	1.71
−18	3.62	1.12	0.52	1.25	0.20	1.58	0.00	3.14	0.00	0.79
−17	3.96	1.21	0.39	1.09	0.00	1.41	0.00	3.35	0.00	0.70
−16	4.55	1.46	0.80	1.69	0.50	2.07	0.00	4.00	0.00	1.03
−15	5.70	2.04	1.71	2.70	1.49	3.12	0.94	5.10	0.00	2.03
−14	4.96	1.52	0.54	1.55	0.26	1.97	0.00	4.32	0.00	0.98
−13	5.57	1.75	0.74	1.75	0.42	2.18	0.00	4.82	0.00	1.09
−12	5.65	1.72	0.49	1.59	0.22	2.04	0.00	4.88	0.00	1.02
−11	6.02	1.83	0.49	1.60	0.19	2.06	0.00	5.19	0.00	1.03
−10	7.02	2.29	1.15	2.31	0.89	2.78	0.21	6.09	0.00	1.50
−9	7.20	2.35	1.13	2.30	0.89	2.76	0.22	6.24	0.00	1.49
−8	7.86	2.64	1.40	2.50	1.15	2.98	0.49	6.73	0.00	1.74
−7	8.09	2.75	1.56	2.69	1.36	3.15	0.71	6.98	0.00	1.93
−6	9.32	3.34	2.06	2.90	1.61	3.33	0.97	7.82	0.00	2.15
−5	9.19	3.29	2.13	3.09	1.86	3.52	1.23	7.92	0.00	2.37
−4	14.10	6.39	6.46	7.19	6.05	7.60	5.46	11.94	0.00	6.53
−3	10.29	3.86	2.71	3.45	2.34	3.84	1.76	8.74	0.00	2.80
−2	23.00	13.60	16.00	16.76	15.81	17.14	15.28	21.82	9.17	16.21
−1	13.88	6.33	6.54	7.34	6.44	7.74	5.92	12.35	0.00	6.83
0										
1	11.75	4.77	3.78	4.14	3.36	4.45	2.88	9.94	0.00	3.67
2	25.16	15.69	18.28	18.77	18.20	19.13	17.79	24.18	12.04	18.46
3	12.04	5.15	4.57	4.98	4.42	5.32	4.02	10.43	0.00	4.67
4	14.55	6.75	6.17	6.09	5.59	6.36	5.22	11.70	0.00	5.79
5	10.57	4.32	3.30	3.46	3.02	3.72	2.66	8.95	0.00	3.19
6	12.87	5.95	5.55	5.58	5.26	5.86	4.95	10.92	0.00	5.41
7	9.98	4.28	3.57	3.70	3.40	3.92	3.11	8.44	0.00	3.51
8	10.66	4.80	4.18	4.10	3.85	4.27	3.58	8.81	0.00	3.93
9	9.66	4.68	4.82	5.06	4.88	5.24	4.66	8.77	0.74	4.95
10	9.86	5.06	5.39	5.61	5.51	5.81	5.33	9.00	1.78	5.57

Supplementary Material Table 18 – Rate coefficients, $k_K^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v$ = 0, J = 30) molecules with potassium atoms, corrected for multiple collision effects (using $n_{Ar} = 2.13\times10^{17}$ cm^{-3} and $n_K = 2.12\times10^{15}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 5th and 6th iteration values.

ΔJ	$k_K^{D\to C(0)}$	$k_K^{D\to C(n)}$ for iteration n (in units of 10^{-10} cm^{3}s^{-1}								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−20	2.34	0.91	0.76	1.18	0.70	1.23	0.65	1.81	0.00	0.94
−19	2.81	1.13	1.04	1.56	1.01	1.63	0.96	2.20	0.16	1.29
−18	3.04	1.17	0.88	1.36	0.77	1.41	0.71	2.13	0.00	1.06
−17	2.99	1.02	0.42	0.99	0.27	1.04	0.20	1.87	0.00	0.62
−16	0.46	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
−15	3.63	1.25	0.55	1.30	0.48	1.38	0.40	2.27	0.00	0.89
−14	4.44	1.66	1.08	1.83	1.03	1.90	0.95	2.91	0.00	1.43
−13	4.05	1.34	0.36	1.24	0.31	1.32	0.22	2.37	0.00	0.77
−12	5.32	1.97	1.14	2.01	1.08	2.10	0.99	3.32	0.00	1.54
−11	4.69	1.56	0.41	1.43	0.40	1.50	0.31	2.67	0.00	0.91
−10	6.12	2.22	1.03	1.93	0.92	2.02	0.82	3.47	0.00	1.42
−9	5.08	1.66	0.21	1.27	0.19	1.33	0.10	2.71	0.00	0.72
−8	8.60	3.58	2.69	3.62	2.62	3.74	2.52	5.18	0.85	3.13
−7	6.80	2.53	1.37	2.51	1.45	2.59	1.36	3.89	0.00	1.98
−6	11.36	5.13	4.21	4.95	3.97	5.06	3.87	6.61	2.19	4.46
−5	6.98	2.50	0.87	1.90	0.85	1.97	0.76	3.58	0.00	1.36
−4	17.97	9.77	9.73	10.29	9.34	10.37	9.24	11.96	7.58	9.81
−3	8.59	3.38	1.91	2.87	1.88	2.92	1.79	4.43	0.09	2.36
−2	30.94	21.64	24.07	24.79	24.00	24.91	23.92	26.39	22.40	24.41
−1	9.85	4.18	3.02	3.92	3.03	3.98	2.96	5.54	1.34	3.47
0										
1	10.35	4.50	3.35	4.14	3.35	4.19	3.28	5.72	1.76	3.73
2	33.01	23.67	26.13	26.71	26.12	26.81	26.06	28.17	24.75	26.43
3	9.19	3.80	2.36	3.06	2.38	3.11	2.32	4.54	0.92	2.71
4	19.23	10.78	10.45	10.65	10.08	10.70	10.01	11.99	8.75	10.35
5	8.02	3.23	1.75	2.36	1.78	2.40	1.73	3.65	0.49	2.07
6	13.09	6.52	5.64	5.93	5.48	6.01	5.43	7.16	4.33	5.72
7	7.33	3.09	2.00	2.51	2.03	2.51	1.99	3.57	0.96	2.25
8	9.70	4.61	3.72	3.98	3.60	4.01	3.55	4.94	2.64	3.78
9	6.72	3.20	2.94	3.45	3.11	3.47	3.09	4.26	2.31	3.28
10	8.01	4.18	4.12	4.49	4.24	4.53	4.21	5.21	3.54	4.37

Supplementary Material Table 19 – Rate coefficients, $k_{Ar}^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 1, J = 26)$ molecules with argon atoms, corrected for multiple collision effects (using $n_{Ar} = 1.50\times10^{17}$ cm^{-3} and $n_K = 1.48\times10^{15}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 99th and 100th iteration values.

ΔJ	$k_{Ar}^{D\to C(0)}$	$k_{Ar}^{D\to C(n)}$ for iteration n (in units of 10^{-11} cm^{3}s^{-1})								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−17	0.93	0.41	0.34	0.45	0.37	0.44	0.38	0.41	0.41	0.41
−16	1.13	0.50	0.41	0.54	0.44	0.52	0.45	0.48	0.48	0.48
−15	1.27	0.55	0.42	0.57	0.45	0.55	0.46	0.50	0.50	0.50
−14	1.59	0.72	0.59	0.75	0.62	0.73	0.64	0.68	0.68	0.68
−13	1.32	0.50	0.19	0.35	0.21	0.33	0.23	0.27	0.27	0.27
−12	1.75	0.73	0.43	0.61	0.46	0.58	0.48	0.53	0.53	0.53
−11	1.76	0.72	0.43	0.64	0.48	0.61	0.50	0.55	0.55	0.55
−10	2.16	0.91	0.55	0.75	0.59	0.72	0.61	0.66	0.66	0.66
−9	2.27	0.99	0.70	0.93	0.76	0.90	0.79	0.84	0.84	0.84
−8	3.09	1.45	1.13	1.36	1.20	1.34	1.22	1.27	1.27	1.27
−7	2.58	1.10	0.67	0.89	0.71	0.86	0.73	0.79	0.79	0.79
−6	4.06	1.98	1.53	1.71	1.54	1.69	1.56	1.62	1.62	1.62
−5	3.36	1.55	1.17	1.40	1.22	1.38	1.24	1.30	1.30	1.30
−4	6.61	3.75	3.39	3.48	3.31	3.45	3.33	3.38	3.38	3.38
−3	4.12	2.00	1.60	1.78	1.61	1.76	1.63	1.69	1.69	1.69
−2	14.69	11.50	12.34	12.54	12.39	12.53	12.41	12.47	12.47	12.47
−1	5.52	3.05	2.93	3.12	2.95	3.10	2.97	3.03	3.03	3.03
0										
1	5.42	2.96	2.79	2.97	2.80	2.95	2.82	2.88	2.88	2.88
2	14.90	11.76	12.60	12.76	12.61	12.74	12.62	12.68	12.68	12.68
3	4.46	2.25	1.93	2.11	1.93	2.09	1.95	2.01	2.01	2.01
4	6.88	4.15	4.04	4.16	4.00	4.13	4.02	4.07	4.07	4.07
5	3.50	1.64	1.26	1.47	1.29	1.45	1.31	1.37	1.37	1.37
6	1.60	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	2.89	1.31	0.99	1.20	1.02	1.18	1.05	1.11	1.11	1.11
8	2.91	1.42	1.31	1.54	1.39	1.52	1.41	1.46	1.46	1.46
9	2.48	1.11	0.84	1.05	0.87	1.02	0.89	0.95	0.95	0.95
10	2.25	1.01	0.78	0.98	0.82	0.95	0.84	0.89	0.89	0.89
11	2.08	0.93	0.74	0.96	0.79	0.94	0.81	0.87	0.87	0.87
12	1.60	0.64	0.35	0.55	0.39	0.52	0.41	0.46	0.46	0.46
13	1.24	0.44	0.08	0.27	0.11	0.25	0.13	0.19	0.19	0.19
14	0.86	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.94	0.31	0.00	0.15	0.00	0.13	0.02	0.07	0.07	0.07
16	1.21	0.51	0.39	0.57	0.45	0.56	0.47	0.51	0.51	0.51
17	1.13	0.47	0.35	0.53	0.40	0.51	0.42	0.46	0.46	0.46
18	0.93	0.36	0.20	0.34	0.22	0.32	0.24	0.27	0.27	0.27
19	0.88	0.34	0.17	0.29	0.18	0.28	0.19	0.23	0.23	0.23
20	0.70	0.25	0.04	0.14	0.03	0.12	0.04	0.08	0.08	0.08
21	0.78	0.31	0.15	0.24	0.14	0.22	0.15	0.18	0.18	0.18
22	0.76	0.35	0.34	0.44	0.37	0.43	0.38	0.40	0.40	0.40
23	0.93	0.50	0.55	0.64	0.57	0.63	0.58	0.61	0.61	0.61

Supplementary Material Table 20 – Rate coefficients, $k_{He}^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 1, J = 26)$ molecules with helium atoms, corrected for multiple collision effects (using $n_{He} = 1.13\times10^{17}$ cm^{-3} and $n_K = 2.92\times10^{14}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 5th and 6th iteration values.

ΔJ	$k_{He}^{D\to C(0)}$	$k_{He}^{D\to C(n)}$ for iteration n (in units of 10^{-11} cm^{3}s^{-1}								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−17	2.11	0.87	0.71	1.02	0.78	1.01	0.78	1.31	0.48	0.89
−16	3.79	1.78	1.65	1.93	1.71	1.94	1.70	2.25	1.39	1.82
−15	2.32	0.85	0.38	0.71	0.40	0.70	0.40	1.07	0.02	0.55
−14	4.80	2.20	1.85	2.15	1.88	2.16	1.87	2.55	1.48	2.01
−13	2.80	1.02	0.41	0.78	0.42	0.77	0.41	1.22	0.00	0.59
−12	5.30	2.26	1.47	1.73	1.41	1.75	1.40	2.20	0.94	1.57
−11	3.70	1.50	1.09	1.57	1.18	1.57	1.17	2.06	0.68	1.37
−10	7.00	3.26	2.69	3.02	2.70	3.06	2.68	3.55	2.19	2.87
−9	3.82	1.45	0.78	1.25	0.80	1.24	0.79	1.78	0.24	1.02
−8	8.65	4.20	3.60	3.88	3.53	3.93	3.51	4.46	2.98	3.72
−7	4.35	1.70	1.05	1.59	1.11	1.59	1.10	2.18	0.50	1.34
−6	11.26	5.91	5.50	5.72	5.34	5.76	5.32	6.32	4.76	5.54
−5	4.23	1.53	0.56	1.08	0.56	1.08	0.55	1.72	0.00	0.82
−4	15.10	8.74	8.72	8.86	8.45	8.90	8.43	9.47	7.86	8.66
−3	5.24	2.12	1.45	2.03	1.50	2.04	1.49	2.69	0.83	1.76
−2	24.13	17.15	18.74	19.04	18.66	19.09	18.64	19.65	18.08	18.87
−1	5.78	2.43	1.84	2.42	1.87	2.43	1.86	3.10	1.18	2.15
0										
1	5.91	2.48	1.85	2.41	1.84	2.42	1.83	3.10	1.14	2.12
2	24.82	17.90	19.60	19.91	19.47	19.93	19.46	20.48	18.90	19.69
3	5.58	2.25	1.52	2.09	1.51	2.10	1.50	2.78	0.81	1.80
4	16.58	10.39	11.14	11.52	11.09	11.55	11.08	12.08	10.52	11.31
5	5.35	2.13	1.38	1.96	1.37	1.96	1.36	2.62	0.67	1.66
6	4.78	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	5.49	2.29	1.78	2.38	1.80	2.39	1.80	3.03	1.13	2.09
8	7.46	3.48	3.12	3.63	3.18	3.64	3.17	4.16	2.62	3.41
9	4.89	1.97	1.39	1.95	1.38	1.95	1.38	2.54	0.74	1.66
10	6.18	2.73	2.24	2.72	2.25	2.71	2.25	3.22	1.71	2.48
11	4.26	1.67	1.11	1.68	1.14	1.68	1.14	2.21	0.54	1.41
12	6.03	2.79	2.57	3.03	2.59	3.03	2.58	3.50	2.06	2.81
13	3.13	1.07	0.29	0.82	0.32	0.82	0.32	1.31	0.00	0.57
14	2.80	0.82	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00
15	2.41	0.74	0.00	0.37	0.00	0.36	0.00	0.84	0.00	0.18
16	3.97	1.68	1.40	1.83	1.45	1.82	1.46	2.19	1.02	1.64
17	2.65	0.96	0.53	1.01	0.59	1.01	0.59	1.36	0.14	0.80
18	3.28	1.37	1.13	1.54	1.19	1.53	1.19	1.85	0.81	1.36
19	2.29	0.82	0.40	0.79	0.41	0.79	0.41	1.11	0.01	0.60
20	2.05	0.67	0.02	0.27	0.00	0.25	0.00	0.59	0.00	0.12
21	1.79	0.60	0.12	0.41	0.06	0.39	0.07	0.72	0.00	0.23
22	2.23	0.96	0.91	1.23	0.97	1.23	0.98	1.44	0.69	1.10
23	2.16	0.98	1.03	1.34	1.08	1.34	1.09	1.56	0.81	1.21

Supplementary Material Table 21 – Rate coefficients, $k_K^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 1, J = 26)$ molecules with potassium atoms, corrected for multiple collision effects (using $n_{Ar} = 1.50\times10^{17}$ cm^{-3} and $n_K = 1.48\times10^{15}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 99th and 100th iteration values.

ΔJ	$k_K^{D\to C(0)}$	$k_K^{D\to C(n)}$ for iteration n (in units of 10^{-10} cm^{3}s^{-1}								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−17	2.32	1.13	1.12	1.45	1.23	1.42	1.26	1.34	1.34	1.34
−16	2.00	0.81	0.49	0.83	0.57	0.78	0.60	0.69	0.69	0.69
−15	1.81	0.61	0.00	0.27	0.00	0.21	0.00	0.09	0.09	0.09
−14	2.78	1.12	0.61	1.05	0.71	0.99	0.75	0.86	0.86	0.86
−13	2.74	1.03	0.32	0.78	0.41	0.72	0.46	0.58	0.58	0.58
−12	3.28	1.24	0.33	0.80	0.41	0.74	0.46	0.58	0.58	0.58
−11	3.66	1.48	0.77	1.32	0.90	1.25	0.96	1.09	1.09	1.09
−10	5.04	2.19	1.40	1.95	1.53	1.89	1.58	1.72	1.72	1.72
−9	4.82	2.07	1.35	1.93	1.46	1.85	1.52	1.67	1.67	1.67
−8	6.89	3.17	2.21	2.71	2.26	2.65	2.32	2.47	2.47	2.47
−7	6.25	2.88	2.20	2.84	2.36	2.77	2.42	2.58	2.58	2.58
−6	11.83	6.51	5.98	6.46	6.01	6.42	6.07	6.23	6.23	6.23
−5	5.96	2.48	1.22	1.82	1.30	1.74	1.37	1.54	1.54	1.54
−4	17.89	10.93	10.48	10.77	10.29	10.69	10.34	10.50	10.50	10.50
−3	7.50	3.43	2.36	3.02	2.52	2.96	2.58	2.76	2.76	2.76
−2	34.31	27.02	28.79	29.27	28.86	29.24	28.91	29.06	29.06	29.06
−1	7.11	3.06	1.57	2.12	1.59	2.03	1.65	1.83	1.83	1.83
0										
1	10.07	5.32	4.85	5.54	5.04	5.48	5.10	5.28	5.28	5.28
2	35.17	28.14	29.92	30.36	29.93	30.30	29.98	30.13	30.13	30.13
3	7.00	3.05	1.70	2.27	1.74	2.18	1.80	1.98	1.98	1.98
4	18.81	12.35	12.54	12.96	12.53	12.90	12.59	12.73	12.73	12.73
5	5.89	2.45	1.18	1.77	1.24	1.68	1.31	1.48	1.48	1.48
6	4.10	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	6.07	2.83	2.25	2.95	2.45	2.88	2.52	2.69	2.69	2.69
8	5.64	2.62	2.16	2.78	2.36	2.72	2.42	2.56	2.56	2.56
9	4.06	1.60	0.66	1.25	0.74	1.15	0.81	0.96	0.96	0.96
10	4.11	1.72	1.05	1.57	1.13	1.49	1.18	1.32	1.32	1.32
11	2.90	1.03	0.11	0.68	0.21	0.60	0.27	0.42	0.42	0.42
12	3.96	1.79	1.45	1.94	1.54	1.87	1.59	1.72	1.72	1.72
13	2.35	0.81	0.03	0.56	0.15	0.50	0.21	0.34	0.34	0.34
14	0.95	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	1.84	0.60	0.00	0.37	0.00	0.30	0.03	0.15	0.15	0.15
16	1.75	0.59	0.03	0.38	0.07	0.33	0.11	0.21	0.21	0.21
17	1.70	0.59	0.09	0.48	0.16	0.44	0.20	0.31	0.31	0.31
18	2.46	1.14	1.04	1.41	1.14	1.37	1.18	1.27	1.27	1.27
19	1.83	0.73	0.41	0.74	0.47	0.70	0.51	0.60	0.60	0.60
20	1.33	0.44	0.00	0.14	0.00	0.09	0.00	0.00	0.00	0.00
21	1.22	0.41	0.00	0.16	0.00	0.11	0.00	0.02	0.02	0.02
22	2.00	1.07	1.17	1.41	1.23	1.39	1.26	1.33	1.33	1.33
23	1.83	0.98	1.06	1.27	1.10	1.24	1.13	1.19	1.19	1.19

Supplementary Material Table 22 – Rate coefficients, $k_{Ar}^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 2, J = 44)$ molecules with argon atoms, corrected for multiple collision effects (using $n_{Ar} = 1.69\times10^{17}$ cm^{-3} and $n_K = 1.65\times10^{14}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 99th and 100th iteration values.

ΔJ	$k_{Ar}^{D\to C(0)}$	$k_{Ar}^{D\to C(n)}$ for iteration n (in units of 10^{-11} cm^{3}s^{-1})								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−17	0.93	0.44	0.44	0.56	0.48	0.55	0.49	0.52	0.52	0.52
−16	0.73	0.27	0.11	0.23	0.14	0.22	0.15	0.18	0.18	0.18
−15	0.85	0.29	0.03	0.16	0.05	0.14	0.06	0.10	0.10	0.10
−14	1.09	0.41	0.18	0.32	0.21	0.31	0.22	0.26	0.26	0.26
−13	1.28	0.49	0.22	0.39	0.26	0.37	0.27	0.32	0.32	0.32
−12	1.65	0.68	0.43	0.61	0.47	0.59	0.48	0.53	0.53	0.53
−11	1.90	0.81	0.57	0.76	0.62	0.74	0.63	0.69	0.69	0.69
−10	2.27	0.98	0.69	0.87	0.72	0.85	0.73	0.79	0.79	0.79
−9	2.36	1.01	0.69	0.88	0.72	0.86	0.74	0.80	0.80	0.80
−8	3.21	1.53	1.27	1.46	1.31	1.45	1.32	1.38	1.38	1.38
−7	3.03	1.36	1.02	1.22	1.06	1.21	1.07	1.14	1.14	1.14
−6	4.14	2.02	1.64	1.79	1.63	1.78	1.64	1.71	1.71	1.71
−5	3.83	1.82	1.48	1.67	1.50	1.65	1.51	1.58	1.58	1.58
−4	6.58	3.71	3.48	3.57	3.39	3.55	3.41	3.47	3.47	3.47
−3	4.83	2.47	2.25	2.44	2.27	2.43	2.28	2.36	2.36	2.36
−2	14.03	10.73	11.64	11.83	11.67	11.82	11.68	11.75	11.75	11.75
−1	5.15	2.60	2.27	2.42	2.23	2.40	2.24	2.32	2.32	2.32
0										
1	6.04	3.36	3.33	3.54	3.36	3.53	3.38	3.45	3.45	3.45
2	13.83	10.47	11.37	11.56	11.40	11.56	11.42	11.48	11.48	11.48
3	4.84	2.41	2.09	2.27	2.08	2.25	2.10	2.17	2.17	2.17
4	6.68	3.74	3.52	3.63	3.45	3.61	3.46	3.53	3.53	3.53
5	3.89	1.80	1.42	1.63	1.45	1.61	1.46	1.54	1.54	1.54
6	4.21	2.00	1.56	1.73	1.56	1.71	1.57	1.64	1.64	1.64
7	3.10	1.35	0.94	1.17	0.99	1.15	1.01	1.08	1.08	1.08
8	3.42	1.59	1.29	1.51	1.34	1.50	1.36	1.42	1.42	1.42
9	2.48	1.02	0.61	0.83	0.66	0.81	0.68	0.74	0.74	0.74
10	2.54	1.08	0.68	0.87	0.71	0.85	0.72	0.78	0.78	0.78
11	2.12	0.87	0.51	0.70	0.55	0.68	0.56	0.62	0.62	0.62
12	2.33	1.05	0.82	1.01	0.87	0.99	0.88	0.93	0.93	0.93
13	1.99	0.87	0.64	0.79	0.65	0.77	0.67	0.71	0.71	0.71
14	1.79	0.77	0.54	0.68	0.55	0.66	0.56	0.61	0.61	0.61
15	1.90	0.97	0.98	1.12	1.02	1.11	1.03	1.07	1.07	1.07
16	1.48	0.69	0.62	0.75	0.65	0.73	0.66	0.70	0.70	0.70

Supplementary Material Table 23 – Rate coefficients, $k_{He}^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v = 2, J = 44)$ molecules with helium atoms, corrected for multiple collision effects (using $n_{He} = 1.13\times10^{17}$ cm^{-3} and $n_K = 2.92\times10^{14}$ cm^{-3}). The zeroth, first through sixth, 999th, and 1000th order (corrected) rate coefficients are given. The final values are the averages of the 999th and 1000th iteration values.

ΔJ	$k_{He}^{D\to C(0)}$	$k_{He}^{D\to C(n)}$ for iteration n (in units of 10^{-11} cm^{3}s^{-1})								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=999$	$n=1000$	Final
−17	1.86	0.82	0.79	1.05	0.89	1.04	0.90	0.97	0.97	0.97
−16	1.81	0.63	0.13	0.38	0.21	0.37	0.21	0.29	0.29	0.29
−15	1.50	0.46	0.00	0.10	0.00	0.07	0.00	0.00	0.00	0.00
−14	2.81	1.05	0.40	0.65	0.44	0.64	0.44	0.54	0.54	0.54
−13	2.34	0.85	0.37	0.68	0.42	0.66	0.43	0.55	0.55	0.55
−12	4.73	2.12	1.64	1.92	1.67	1.92	1.67	1.80	1.80	1.80
−11	3.23	1.30	0.90	1.28	0.97	1.26	0.98	1.12	1.12	1.12
−10	6.79	3.32	2.95	3.22	2.95	3.23	2.95	3.09	3.09	3.09
−9	3.66	1.45	0.90	1.28	0.92	1.26	0.94	1.10	1.10	1.10
−8	8.67	4.39	3.98	4.21	3.92	4.23	3.92	4.07	4.07	4.07
−7	4.38	1.81	1.30	1.74	1.34	1.72	1.36	1.54	1.54	1.54
−6	11.03	5.87	5.53	5.71	5.41	5.74	5.40	5.57	5.57	5.57
−5	4.95	2.09	1.60	2.08	1.65	2.06	1.67	1.86	1.86	1.86
−4	14.68	8.48	8.45	8.57	8.24	8.59	8.23	8.41	8.41	8.41
−3	4.99	2.02	1.36	1.86	1.40	1.83	1.41	1.62	1.62	1.62
−2	23.70	16.71	18.27	18.56	18.24	18.60	18.24	18.42	18.42	18.42
−1	5.19	2.10	1.42	1.96	1.47	1.93	1.49	1.71	1.71	1.71
0										
1	5.34	2.19	1.56	2.12	1.64	2.10	1.65	1.87	1.87	1.87
2	24.56	17.31	18.94	19.25	18.92	19.29	18.91	19.10	19.10	19.10
3	4.98	1.95	1.18	1.71	1.22	1.69	1.24	1.46	1.46	1.46
4	15.59	8.93	8.88	9.02	8.67	9.04	8.66	8.85	8.85	8.85
5	4.78	1.87	1.12	1.65	1.18	1.62	1.19	1.40	1.40	1.40
6	11.65	5.98	5.41	5.62	5.28	5.65	5.27	5.46	5.46	5.46
7	4.52	1.77	1.08	1.59	1.15	1.57	1.16	1.36	1.36	1.36
8	9.73	4.81	4.27	4.56	4.25	4.60	4.24	4.42	4.42	4.42
9	4.01	1.53	0.80	1.26	0.85	1.24	0.86	1.05	1.05	1.05
10	7.48	3.38	2.54	2.79	2.49	2.81	2.48	2.64	2.64	2.64
11	3.64	1.39	0.74	1.14	0.77	1.12	0.78	0.95	0.95	0.95
12	7.04	3.39	3.01	3.33	3.06	3.35	3.05	3.20	3.20	3.20
13	3.56	1.46	1.05	1.39	1.06	1.36	1.06	1.21	1.21	1.21
14	5.32	2.40	1.89	2.13	1.88	2.13	1.87	2.00	2.00	2.00
15	3.69	1.79	1.84	2.18	1.92	2.17	1.93	2.05	2.05	2.05
16	4.26	1.98	1.76	2.02	1.82	2.03	1.82	1.93	1.93	1.93

Supplementary Material Table 24 – Rate coefficients, $k_K^{\Delta J}$, for rotationally inelastic collisions of NaK $2(A)^1\Sigma^+(v$ = 2, J = 44) molecules with potassium atoms, corrected for multiple collision effects (using $n_{Ar} = 1.69\times10^{17}$ cm^{-3} and $n_K = 1.65\times10^{14}$ cm^{-3}). The zeroth, first through sixth, 99th, and 100th order (corrected) rate coefficients are given. The final values are the averages of the 99th and 100th iteration values.

ΔJ	$k_K^{D\to C(0)}$	$k_K^{D\to C(n)}$ for iteration n (in units of 10^{-10} cm^{3}s^{-1}								
		$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=99$	$n=100$	Final
−17	0.50	0.14	0.00	0.07	0.00	0.04	0.00	0.01	0.01	0.01
−16	0.33	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
−15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
−14	1.06	0.32	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
−13	1.28	0.41	0.00	0.17	0.00	0.10	0.00	0.02	0.02	0.02
−12	2.44	1.03	0.61	1.02	0.74	0.96	0.79	0.87	0.87	0.87
−11	1.96	0.71	0.06	0.52	0.21	0.45	0.27	0.35	0.35	0.35
−10	3.55	1.60	1.09	1.59	1.24	1.52	1.30	1.40	1.40	1.40
−9	2.63	1.00	0.21	0.76	0.41	0.68	0.47	0.56	0.56	0.56
−8	3.81	1.53	0.43	0.90	0.49	0.82	0.55	0.67	0.67	0.67
−7	2.37	0.74	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
−6	8.44	4.62	4.11	4.65	4.21	4.58	4.28	4.41	4.41	4.41
−5	3.51	1.30	0.02	0.69	0.23	0.60	0.31	0.44	0.44	0.44
−4	14.16	8.85	8.51	8.93	8.43	8.83	8.50	8.65	8.65	8.65
−3	3.89	1.44	0.00	0.70	0.18	0.60	0.25	0.41	0.41	0.41
−2	29.57	24.00	25.49	26.09	25.62	26.02	25.69	25.84	25.84	25.84
−1	4.33	1.62	0.00	0.70	0.13	0.59	0.21	0.38	0.38	0.38
0										
1	4.79	1.94	0.61	1.41	0.84	1.32	0.92	1.11	1.11	1.11
2	30.08	24.32	25.87	26.50	25.98	26.44	26.06	26.23	26.23	26.23
3	4.10	1.50	0.00	0.65	0.05	0.55	0.13	0.32	0.32	0.32
4	14.80	9.25	8.99	9.48	8.90	9.39	8.98	9.16	9.16	9.16
5	3.58	1.26	0.00	0.58	0.00	0.48	0.06	0.25	0.25	0.25
6	8.59	4.53	3.87	4.46	3.90	4.39	3.97	4.16	4.16	4.16
7	3.29	1.18	0.00	0.73	0.17	0.66	0.25	0.44	0.44	0.44
8	5.26	2.38	1.58	2.20	1.67	2.14	1.74	1.92	1.92	1.92
9	3.21	1.24	0.38	1.08	0.54	1.00	0.61	0.79	0.79	0.79
10	3.55	1.41	0.47	1.02	0.51	0.95	0.57	0.75	0.75	0.75
11	2.51	0.91	0.08	0.68	0.19	0.61	0.25	0.42	0.42	0.42
12	3.36	1.47	0.97	1.51	1.06	1.45	1.12	1.27	1.27	1.27
13	1.97	0.69	0.00	0.45	0.02	0.38	0.07	0.21	0.21	0.21
14	2.59	1.10	0.66	1.08	0.70	1.03	0.74	0.87	0.87	0.87
15	1.80	0.74	0.48	0.89	0.57	0.85	0.61	0.72	0.72	0.72
16	1.61	0.63	0.31	0.65	0.36	0.62	0.40	0.50	0.50	0.50

Supplementary Material Table 25 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 2.82 \times 10^7$ s^{-1}] for rotationally inelastic collisions of NaCs $2(A)^1\Sigma^+(v = 14, J = 32)$ molecules with argon and cesium atoms ($p = Ar$ and Cs). In this fit, the value of k_{Cs}^{Q}/Γ was allowed to vary freely.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $\left(10^{-18}\ cm^3\right)$	$k_{Cs}^{\Delta J}/\Gamma$ $\left(10^{-17}\ cm^3\right)$	$k_{Ar}^{\Delta J}$ $\left(10^{-11}\ cm^3s^{-1}\right)$	$k_{Cs}^{\Delta J}$ $\left(10^{-10}\ cm^3s^{-1}\right)$
−4	0.77 ± 0.13	0.06 ± 0.06	2.16 ± 0.35	0.18 ± 0.17
−3	0.88 ± 0.13	0.14 ± 0.07	2.47 ± 0.37	0.39 ± 0.21
−2	1.63 ± 0.21	0.17 ± 0.11	4.61 ± 0.58	0.49 ± 0.30
−1	3.57 ± 0.43	0.32 ± 0.21	10.06 ± 1.22	0.89 ± 0.60
0				
1	3.33 ± 0.39	0.00 ± 0.14	9.38 ± 1.09	0.00 ± 0.40
2	1.89 ± 0.23	0.18 ± 0.12	5.34 ± 0.66	0.52 ± 0.33
3	1.03 ± 0.14	0.11 ± 0.07	2.92 ± 0.39	0.32 ± 0.19
4	0.79 ± 0.10	0.02 ± 0.03	2.21 ± 0.29	0.06 ± 0.10
	k_{Ar}^{Q}/Γ $\left(10^{-18}\ cm^3\right)$	k_{Cs}^{Q}/Γ $\left(10^{-17}\ cm^3\right)$	k_{Ar}^{Q} $\left(10^{-11}\ cm^3s^{-1}\right)$	k_{Cs}^{Q} $\left(10^{-10}\ cm^3s^{-1}\right)$
	25.77 ± 4.47	2.24 ± 2.28	72.68 ± 12.61	6.32 ± 6.43

Supplementary Material Table 26 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 2.82 \times 10^7$ s^{-1}] for rotationally inelastic collisions of NaCs $2(A)^1\Sigma^+(v = 14, J = 32)$ molecules with argon and cesium atoms ($p = Ar$ and Cs). In this fit, the value of k_{Cs}^{Q}/Γ was allowed to vary between the limits 1×10^{-17} cm^3 and 1×10^{-15} cm^3.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{Cs}^{\Delta J}/\Gamma$ $(10^{-17}\ cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{Cs}^{\Delta J}$ $(10^{-10}\ cm^3s^{-1})$
−4	0.77 ± 0.13	0.06 ± 0.06	2.17 ± 0.35	0.18 ± 0.17
−3	0.88 ± 0.13	0.14 ± 0.07	2.48 ± 0.37	0.39 ± 0.21
−2	1.64 ± 0.21	0.17 ± 0.11	4.63 ± 0.58	0.48 ± 0.30
−1	3.58 ± 0.43	0.31 ± 0.21	10.11 ± 1.23	0.88 ± 0.60
0				
1	3.34 ± 0.39	0.00 ± 0.14	9.41 ± 1.09	0.00 ± 0.40
2	1.90 ± 0.24	0.18 ± 0.12	5.37 ± 0.66	0.52 ± 0.33
3	1.04 ± 0.14	0.11 ± 0.07	2.94 ± 0.39	0.32 ± 0.19
4	0.79 ± 0.10	0.02 ± 0.03	2.23 ± 0.29	0.06 ± 0.10
	k_{Ar}^{Q}/Γ $(10^{-18}\ cm^3)$	k_{Cs}^{Q}/Γ $(10^{-17}\ cm^3)$	k_{Ar}^{Q} $(10^{-11}\ cm^3s^{-1})$	k_{Cs}^{Q} $(10^{-10}\ cm^3s^{-1})$
	25.97 ± 4.50	2.21 ± 2.28	73.23 ± 12.69	6.23 ± 6.43

Supplementary Material Table 27 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 2.82 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaCs $2(A)^1\Sigma^+(v = 14, J = 32)$ molecules with argon and cesium atoms ($p = Ar$ and Cs). In this fit, the value of k_{Cs}^{Q}/Γ was fixed at 0.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $\left(10^{-18}\ cm^3\right)$	$k_{Cs}^{\Delta J}/\Gamma$ $\left(10^{-17}\ cm^3\right)$	$k_{Ar}^{\Delta J}$ $\left(10^{-11}\ cm^3s^{-1}\right)$	$k_{Cs}^{\Delta J}$ $\left(10^{-10}\ cm^3s^{-1}\right)$
−4	0.75 ± 0.11	0.02 ± 0.04	2.11 ± 0.32	0.06 ± 0.11
−3	0.88 ± 0.11	0.06 ± 0.02	2.49 ± 0.31	0.18 ± 0.06
−2	1.60 ± 0.18	0.07 ± 0.02	4.52 ± 0.50	0.20 ± 0.07
−1	3.50 ± 0.37	0.10 ± 0.05	9.88 ± 1.05	0.27 ± 0.13
0				
1	2.85 ± 0.29	0.00 ± 0.03	8.05 ± 0.83	0.00 ± 0.09
2	1.86 ± 0.20	0.07 ± 0.03	5.25 ± 0.57	0.19 ± 0.08
3	1.01 ± 0.12	0.05 ± 0.02	2.84 ± 0.34	0.14 ± 0.05
4	0.74 ± 0.09	0.00 ± 0.01	2.08 ± 0.25	0.00 ± 0.04
	k_{Ar}^{Q}/Γ $\left(10^{-18}\ cm^3\right)$	k_{Cs}^{Q}/Γ $\left(10^{-17}\ cm^3\right)$	k_{Ar}^{Q} $\left(10^{-11}\ cm^3s^{-1}\right)$	k_{Cs}^{Q} $\left(10^{-10}\ cm^3s^{-1}\right)$
	24.83 ± 3.80	0.00 (fixed)	70.01 ± 10.72	0.00 (fixed)

Supplementary Material Table 28 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 2.82 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaCs $2(A)^1\Sigma^+(v = 14, J = 32)$ molecules with argon and cesium atoms ($p = Ar$ and Cs). In this fit, the value of k_{Cs}^Q/Γ was fixed at $1.0 \times 10^{-16}\ cm^3$.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{Cs}^{\Delta J}/\Gamma$ $(10^{-17}\ cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{Cs}^{\Delta J}$ $(10^{-10}\ cm^3s^{-1})$
−4	0.73 ± 0.13	0.21 ± 0.05	2.06 ± 0.36	0.59 ± 0.13
−3	0.75 ± 0.13	0.39 ± 0.03	2.13 ± 0.36	1.11 ± 0.08
−2	1.54 ± 0.21	0.52 ± 0.03	4.35 ± 0.58	1.47 ± 0.08
−1	3.36 ± 0.43	1.07 ± 0.05	9.48 ± 1.23	3.00 ± 0.14
0				
1	3.43 ± 0.42	0.39 ± 0.07	9.68 ± 1.18	1.11 ± 0.19
2	1.79 ± 0.24	0.58 ± 0.03	5.05 ± 0.67	1.63 ± 0.09
3	0.98 ± 0.14	0.33 ± 0.02	2.76 ± 0.40	0.94 ± 0.06
4	0.78 ± 0.11	0.12 ± 0.02	2.21 ± 0.32	0.34 ± 0.07
	k_{Ar}^Q/Γ $(10^{-18}\ cm^3)$	k_{Cs}^Q/Γ $(10^{-17}\ cm^3)$	k_{Ar}^Q $(10^{-11}\ cm^3s^{-1})$	k_{Cs}^Q $(10^{-10}\ cm^3s^{-1})$
	24.19 ± 4.49	10.00 (fixed)	68.22 ± 12.66	28.20 (fixed)

Supplementary Material Table 29 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 2.82 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaCs $2(A)^1\Sigma^+(v = 14, J = 32)$ molecules with argon and cesium atoms ($p = Ar$ and Cs). In this fit, the value of k_{Cs}^Q/Γ was fixed at $3.0 \times 10^{-16}\ cm^3$.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{Cs}^{\Delta J}/\Gamma$ $(10^{-17}\ cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{Cs}^{\Delta J}$ $(10^{-10}\ cm^3s^{-1})$
−4	0.69 ± 0.15	0.58 ± 0.06	1.94 ± 0.43	1.64 ± 0.16
−3	0.55 ± 0.16	0.99 ± 0.04	1.56 ± 0.44	2.80 ± 0.13
−2	1.40 ± 0.25	1.39 ± 0.04	3.94 ± 0.71	3.92 ± 0.11
−1	3.04 ± 0.53	2.93 ± 0.06	8.58 ± 1.49	8.26 ± 0.17
0				
1	3.64 ± 0.54	1.39 ± 0.09	10.26 ± 1.53	3.92 ± 0.24
2	1.63 ± 0.29	1.56 ± 0.04	4.60 ± 0.81	4.40 ± 0.12
3	0.89 ± 0.17	0.90 ± 0.03	2.50 ± 0.48	2.53 ± 0.09
4	0.78 ± 0.14	0.37 ± 0.04	2.20 ± 0.40	1.05 ± 0.11
	k_{Ar}^{Q}/Γ $(10^{-18}\ cm^3)$	k_{Cs}^{Q}/Γ $(10^{-17}\ cm^3)$	k_{Ar}^{Q} $(10^{-11}\ cm^3s^{-1})$	k_{Cs}^{Q} $(10^{-10}\ cm^3s^{-1})$
	22.02 ± 5.57	30.00 (fixed)	62.10 ± 15.72	84.60 (fixed)

Supplementary Material Table 30 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 2.82 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaCs $2(A)^1\Sigma^+(v = 14, J = 32)$ molecules with argon and cesium atoms ($p = Ar$ and Cs). In this fit, the value of k_{Cs}^Q/Γ was fixed at $5.0 \times 10^{-16}\ cm^3$.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{Cs}^{\Delta J}/\Gamma$ $(10^{-17}\ cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{Cs}^{\Delta J}$ $(10^{-10}\ cm^3s^{-1})$
−4	0.67 ± 0.18	0.95 ± 0.06	1.88 ± 0.51	2.68 ± 0.18
−3	0.42 ± 0.18	1.57 ± 0.06	1.18 ± 0.52	4.44 ± 0.17
−2	1.31 ± 0.30	2.25 ± 0.05	3.68 ± 0.85	6.33 ± 0.13
−1	2.85 ± 0.63	4.75 ± 0.07	8.04 ± 1.77	13.39 ± 0.20
0				
1	3.83 ± 0.67	2.38 ± 0.11	10.81 ± 1.90	6.71 ± 0.30
2	1.54 ± 0.34	2.53 ± 0.05	4.34 ± 0.97	7.13 ± 0.15
3	0.83 ± 0.20	1.46 ± 0.04	2.33 ± 0.58	4.12 ± 0.11
4	0.79 ± 0.17	0.63 ± 0.05	2.22 ± 0.49	1.77 ± 0.14
	k_{Ar}^{Q}/Γ $(10^{-18}\ cm^3)$	k_{Cs}^{Q}/Γ $(10^{-17}\ cm^3)$	k_{Ar}^{Q} $(10^{-11}\ cm^3s^{-1})$	k_{Cs}^{Q} $(10^{-10}\ cm^3s^{-1})$
	20.93 ± 6.76	50.00 (fixed)	59.01 ± 19.07	141.00 (fixed)

Supplementary Material Table 31 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 2.82 \times 10^7\ s^{-1}$] for rotationally inelastic collisions of NaCs $2(A)^1\Sigma^+(v = 14, J = 32)$ molecules with argon and cesium atoms ($p = Ar$ and Cs). In this fit, the value of k_{Cs}^{Q}/Γ was fixed at $7.0 \times 10^{-16}\ cm^3$.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}\ cm^3)$	$k_{Cs}^{\Delta J}/\Gamma$ $(10^{-17}\ cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}\ cm^3s^{-1})$	$k_{Cs}^{\Delta J}$ $(10^{-10}\ cm^3s^{-1})$
−4	0.67 ± 0.21	1.32 ± 0.07	1.88 ± 0.59	3.73 ± 0.21
−3	0.30 ± 0.21	2.15 ± 0.08	0.84 ± 0.61	6.07 ± 0.22
−2	1.27 ± 0.35	3.09 ± 0.06	3.58 ± 0.99	8.73 ± 0.16
−1	2.77 ± 0.74	6.54 ± 0.08	7.81 ± 2.08	18.44 ± 0.23
0				
1	4.09 ± 0.81	3.37 ± 0.13	11.53 ± 2.29	9.49 ± 0.36
2	1.50 ± 0.41	3.48 ± 0.06	4.24 ± 1.14	9.83 ± 0.18
3	0.80 ± 0.24	2.03 ± 0.05	2.27 ± 0.68	5.71 ± 0.14
4	0.82 ± 0.20	0.88 ± 0.07	2.31 ± 0.58	2.49 ± 0.18
	k_{Ar}^{Q}/Γ $(10^{-18}\ cm^3)$	k_{Cs}^{Q}/Γ $(10^{-17}\ cm^3)$	k_{Ar}^{Q} $(10^{-11}\ cm^3s^{-1})$	k_{Cs}^{Q} $(10^{-10}\ cm^3s^{-1})$
	20.93 ± 8.09	70.00 (fixed)	59.01 ± 22.83	197.40 (fixed)

Supplementary Material Table 32 – Rate coefficients $\left(k_p^{\Delta J}\right)$ in units of the radiative rate Γ and in units of cm^3s^{-1} [obtained by multiplying the fitted parameters $\left(k_p^{\Delta J}/\Gamma\right)$ by $\Gamma = 2.82 \times 10^7$ s^{-1}] for rotationally inelastic collisions of NaCs $2(A)^1\Sigma^+(v = 14, J = 32)$ molecules with argon and cesium atoms ($p = Ar$ and Cs). In this fit, the value of k_{Cs}^Q/Γ was fixed at 10.0×10^{-16} cm^3.

ΔJ	$k_{Ar}^{\Delta J}/\Gamma$ $(10^{-18}$ $cm^3)$	$k_{Cs}^{\Delta J}/\Gamma$ $(10^{-17}$ $cm^3)$	$k_{Ar}^{\Delta J}$ $(10^{-11}$ $cm^3s^{-1})$	$k_{Cs}^{\Delta J}$ $(10^{-10}$ $cm^3s^{-1})$
−4	0.71 ± 0.26	1.87 ± 0.09	2.00 ± 0.74	5.28 ± 0.26
−3	0.10 ± 0.27	3.04 ± 0.11	0.29 ± 0.78	8.58 ± 0.30
−2	1.30 ± 0.44	4.36 ± 0.07	3.66 ± 1.25	12.29 ± 0.19
−1	2.83 ± 0.93	9.20 ± 0.10	7.97 ± 2.61	25.94 ± 0.27
0				
1	4.62 ± 1.05	4.84 ± 0.16	13.04 ± 2.95	13.64 ± 0.46
2	1.55 ± 0.51	4.91 ± 0.08	4.37 ± 1.45	13.85 ± 0.22
3	0.83 ± 0.30	2.87 ± 0.06	2.34 ± 0.86	8.10 ± 0.18
4	0.91 ± 0.26	1.26 ± 0.09	2.56 ± 0.73	3.55 ± 0.24
	k_{Ar}^{Q}/Γ $(10^{-18}$ $cm^3)$	k_{Cs}^{Q}/Γ $(10^{-17}$ $cm^3)$	k_{Ar}^{Q} $(10^{-11}$ $cm^3s^{-1})$	k_{Cs}^{Q} $(10^{-10}$ $cm^3s^{-1})$
	22.94 ± 10.44	100.00 (fixed)	64.68 ± 29.44	282.00 (fixed)