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$$C_8^+ + e^- \rightarrow C_7 + C \quad (1)$$
$$\rightarrow C_6 + C_2 \quad (2)$$
$$\rightarrow C_5 + C_3 \quad (3)$$
$$\rightarrow C_4 + C_4 \quad (4)$$
$$\rightarrow C_3 + C_3 + C_2 \quad (5)$$

Thermodynamic Data

ΔH^o_0 (1) = - 353 kJ mol^{-1}

ΔH^o_0 (2) = - 323 kJ mol^{-1}

ΔH^o_0 (3) = - 498 kJ mol^{-1}

ΔH^o_0 (4) = - 295 kJ mol^{-1}

ΔH^o_0 (5) = + 62 kJ mol^{-1}

Ionisation Potential = 883 kJ mol^{-1} = 9.15 eV

Thermochemical data have been obtained with ΔH^o_0=DE-IP. DE from Diaz-Tendero et al (2006 IP (vertical) from Belau et al (2007) (estimated error bars 0.1). Estimated error bars on ΔH values: ~ 60kJ mol^{-1}

Rate Coefficient Data

k / cm^3 molecule^{-1} s^{-1}	T / K	Reference	Comments
Rate Coefficient Measurement			
None			
Reviews and Evaluations			
$2.0 \times 10^{-6}(T/300)^{-0.3}$		OSU09 website	(a)
$2.0 \times 10^{-6}(T/300)^{-0.3}$	10-300	UMIST06 database	(a)
Branching Fraction Measurement			
(1) = 0.03 (±0.005)		Chabot 2006, 2010	(b)
(2) = 0.01 (±0.005)			
(3) = 0.90 (±0.04)			
(4)= 0.06 (±0.01)			
Branching fraction Reviews and Evaluations			
(1) = (2) = 0.5; (3) = (4) = 0.0		OSU09 website	
(1) = (2) = 0.5; (3) = (4) = 0.0	10-300	UMIST06 database	

Comments

(a) OSU and UMIST estimations for reaction rates and branching fractions are from Herbst & Leung (1989). Lognormal factor 1.25 of accuracy is reported.

(b) Measurements have been performed with High Velocity Collision experiments on hot (3000°K) C^+_8 clusters produced by a sputtering source and capturing an electron from an atom. Results have been interpreted satisfactorily

within a statistical fragmentation behaviour (Martinet, 2004). Derivation of these experimental results in astrochemical context assumes that statistical fragmentation occurs under DR process (Chabot 2010).

Preferred Values

Rate constant:
$k = 2 \times 10^{-6}\ (T/300)^{-0.3}$ cm^3 molecule^{-1} s^{-1}

Reliability of rate constant:
F0=2; g=0

Recommended Branching Fractions:
(1) = 0.0
(2) = 0.20
(3) = 0.80

Reliability of Branching Fractions:
±0.1 (uniform)

References

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