

Errata

**Erratum: Charge transfer in proton-helium collisions**  
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The second of the set of Eq. (13) should read as

$$\langle \vec{k}' | Y^+ | \vec{k} \rangle = 2 \langle \vec{k}' | Y_{21}^{(1)} | \vec{k} \rangle + 2 \int \frac{d\vec{k}''}{E - E_1'' + i\epsilon} \langle \vec{k}' | Y_{21}^{(1)} | \vec{k}'' \rangle \langle \vec{k}'' | Y_{11} | \vec{k} \rangle + \int \frac{d\vec{k}''}{E - E_2'' + i\epsilon} \langle \vec{k}' | Y_{22}^{(1)} | \vec{k}'' \rangle \langle \vec{k}'' | Y^+ | \vec{k} \rangle,$$

where

$$\langle \vec{k}' | Y^+ | \vec{k} \rangle \equiv \langle \vec{k}' | Y_{21} | \vec{k} \rangle + \langle \vec{k}' | Y_{31} | \vec{k} \rangle, \quad \langle \vec{k}' | Y_{22}^{(1)} | \vec{k}'' \rangle \equiv \langle \vec{k}' | Y_{22}^{(1)} | \vec{k}'' \rangle + \langle \vec{k}' | Y_{23}^{(1)} | \vec{k}'' \rangle,$$

and the corresponding equation in Eq. (16) should read as

$$f^+(\hat{k}' \cdot \hat{k}) = 2f_{21}^B(\hat{k}' \cdot \hat{k}) + \frac{i}{2\pi} \left( \int [\vec{k}_1 f_{21}^B(\hat{k}' \cdot \hat{k}'') f_{11}(\hat{k}'' \cdot \hat{k}) + \frac{1}{2} \vec{k}_x f_{22}^{+B}(\hat{k}' \cdot \hat{k}'') f^+(\hat{k}'' \cdot \hat{k})] \sin\theta'' d\theta'' d\varphi'' \right),$$

with  $f_{22}^{+B} = f_{22}^B + f_{23}^B$ ,  $f_{23}^B$  being the exchange integral. Table I shows the corrected results for CCA calculation, and Fig. 1 the corrected results for low incident proton velocity (1–6 cm/sec).

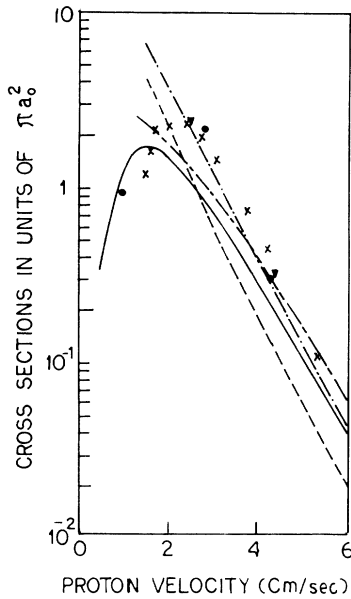


FIG. 1. Results for the ground-state charge-transfer cross sections presented for low incident proton velocity 1–6 cm/sec. (—) present calculation; (---) Bransden and Sin Fai Lam (Ref. 8); (-·-) BDK (Ref. 1); (-●-) Mapleton (Ref. 2); (×) Barnet, Stier, Reynolds, and Allison (Ref. 11); (●) Green *et al.* (Ref. 10); (▼) Begum *et al.* (Ref. 16).

TABLE I. Ground-state total cross sections<sup>a</sup> including the exchange term for the elastic and charge-exchange scattering of protons by helium atoms in units of  $\pi a_0^2$ .

Lab energy (keV)	Close-coupling Direct	Close-coupling Capture
1	2.7760	0.3597
5	1.5385	1.1196
10	1.3102	1.7376
15	1.1266	1.6690
18	1.0322	1.5566
20	0.9765	1.4727
22	0.9264	1.3903
24	0.8819	1.3100
26	0.8421	1.2334
30	0.7174	1.1201
35	0.6653	0.9600
40	0.6237	0.8252
50	0.5589	0.6194
100	0.3886	0.1817
200	0.2500	0.2974 (-1)
395	0.1507	0.2646 (-2)
500	0.1247	0.9912 (-3)
1000	0.6922 (-1)	0.3881 (-4)

<sup>a</sup> The number in parentheses in each entry is the exponent of 10 by which the cross-section value should be multiplied.