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## General discussion

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## General discussion

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In answer to a question about the possible effects of ion-pair states on the Rydberg states of  $S_2$ , I suggest that there could be quite profound effects. Lawley & Donovan (1993) have recently reviewed this area and have pointed to several cases where substantial perturbations are observed. In general the inner repulsive wall of the ion-pair states can be expected to cut through part of the Rydberg manifold, creating avoided crossings and other perturbations.

There is an interesting coupling between Rydberg states  $nd$  ion-pair state continua, which results in the formation of free ions, i.e.



Examples of this process have recently been described for  $\text{Br}_2$ ,  $\text{I}_2$ ,  $\text{ICl}$ ,  $\text{IBr}$  and  $\text{BrCl}$  (Yencha *et al.* 1990; Kvaran *et al.* 1991; Kaur *et al.* 1993).

### References

- Kaur, D., Yencha, A. J., Donovan, R. J., Kvaran, A. & Hopkirk, A. 1993 *Org. Mass. Spectrom.* **28**, 327.
- Kvaran, A., Yencha, A. J., Kela, D. K., Donovan, R. J. & Hopkirk, A. 1991 *Chem. Phys. Lett.* **179**, 263.
- Lawley, K. P. & Donovan, R. J. 1993 *J. Chem. Soc. Faraday Trans.* **89**, 1885.
- Yencha, A. J., Kela, D. K., Donovan, R. J., Hopkirk, A. & Kvaran, A. 1990 *Chem. Phys. Lett.* **165**, 283.

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