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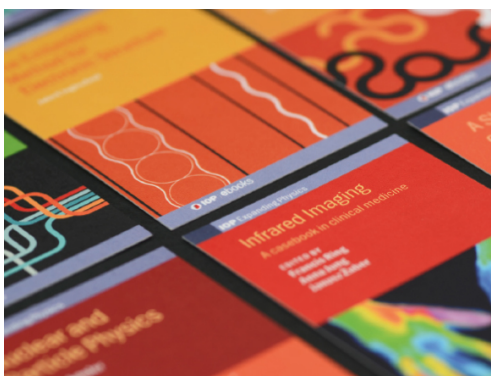
## Electron dissociative attachment to $\text{ArH}^+$ , $\text{HD}^+$ , $\text{N}_2^+$ and $\text{CO}_2$

To cite this article: A Abdoulanziz *et al* 2020 *J. Phys.: Conf. Ser.* **1412** 172005

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## Electron dissociative attachment to $\text{ArH}^+$ , $\text{HD}^+$ , $\text{N}_2^+$ and $\text{CO}_2$

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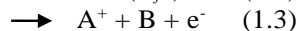
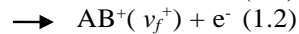
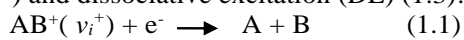
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**Synopsis** We will present our recent results in the study of electron-induced reactivity of ionized and neutral molecules. The Configuration Interaction method and the Multichannel Quantum Defect Theory have been employed in order to obtain cross sections for collisions of electrons with  $\text{ArH}^+$ ,  $\text{HD}^+$ ,  $\text{N}_2$  and  $\text{CO}_2$ .

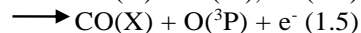
Using the Multichannel Quantum Defect Theory (MQDT) [1-6], we computed the cross sections and the rate coefficients for the dissociative recombination (DR) (1.1) and the related competitive processes - vibrational excitation or de-excitation (VE or VdE) (1.2) ( $v_f^+ > v_i^+$  or  $v_f^+ < v_i^+$ ) and dissociative excitation (DE) (1.3):



AB standing for  $\text{ArH}$ [7],  $\text{HD}$  and  $\text{N}_2$ [6]. Here  $v_i^+$  and  $v_f^+$  stand for the initial and final vibrational quantum number of the target ion.

These processes occur in the interstellar media, in (re)entry, fusion edge and laboratory plasmas.

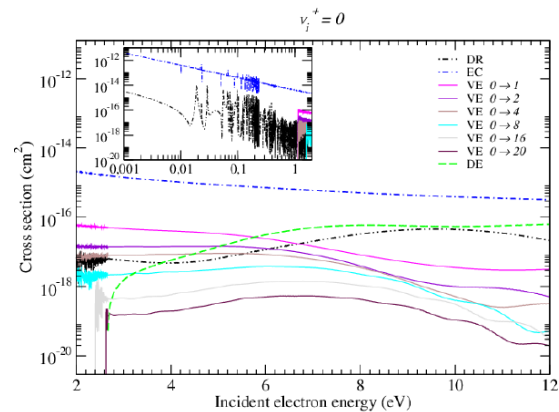
The configuration interaction method [8] has been alternatively used for exploring the dissociative electron attachment (1.4) and dissociative excitation (1.5) of  $\text{CO}_2$  whose removal is crucial for depollution:



The study of the reactional dynamics relies on the calculation of the relevant potential energy curves and of the corresponding mutual interactions. In these calculations one bond of the target (OC-O) has been stretched only, in order to obtain CO in its electronic ground state.

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**Figure 1.** Reactive collisions of  $\text{HD}^+$  in its ground vibrational state with electrons.

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