

Abstract Submitted  
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**Formation of the negative molecular ion  $MH^-$  by radiative association of a neutral molecule  $M$  with  $H^-$** - VIATCHESLAV KOKOOLINE, University of Central Florida, MEHDI AYOZ, University of Marquette, MAURICE RAOULT, OLIVIER DULIEU, Lab. Aime Cotton, University of Paris XI — We consider the formation of negative molecular ions  $MH^-$  through the reaction of radiative association:  $M+H^- \rightarrow MH^- + \gamma$ , where  $M$  is a diatomic or triatomic neutral molecule. We present a theoretical approach to calculate the cross-section and the rate constant for the reaction and apply the theory to study formation of molecular ions from  $H^-$  and neutral molecules abundant in the interstellar medium (ISM): We consider  $H_2$ ,  $CO$ , and  $H_2O$  as possible candidates to form negative ions. Such ions have never been observed in the ISM. Their eventual observation would serve as a proof of presence of  $H^-$  in the ISM too. The  $H^-$  ion cannot be detected directly by the photoabsorption spectroscopy. Supported by Triangle de la Physique contract QCCM and the National Science Foundation grant PHY-0855622

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