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Small Molecule Processes in ITER[1] J. BRIAN A. MITCHELL, SOPHIE CARLES, Université de Rennes I, JEAN-LUC LEGARREC, Université de Rennes — The International Thermonuclear Experimental Reactor (ITER), will present new problems related to energy management in plasma devices. In particular the management of the very high power loads encountered in the divertor and edge plasmas requires a thorough knowledge of atomic and molecular processes in these areas as these are critical to the necessary cooling of the plasma before it encounters solid surfaces that would otherwise be destroyed. These processes include excitation, ionization and recombination but also two and three body association reactions that can produce small molecular species from atomic constituents. Modern tokamaks have exposed surfaces that are commonly composed of carbon bricks and ITER will probably start off with this. Carbon, however, presents serious problems of dust production and tritium trapping so current thinking is to replace it with beryllium. The IAEA has initiated a Coordinated Research Project (CRP) specifically addressing A&M processes for light elements including specifically hydrogen, helium, lithium and beryllium but also with an interest in carbon, nitrogen and oxygen. Reactions responsible for the formation and destruction of small molecular ions will be reviewed and needs for further work will be highlighted.

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