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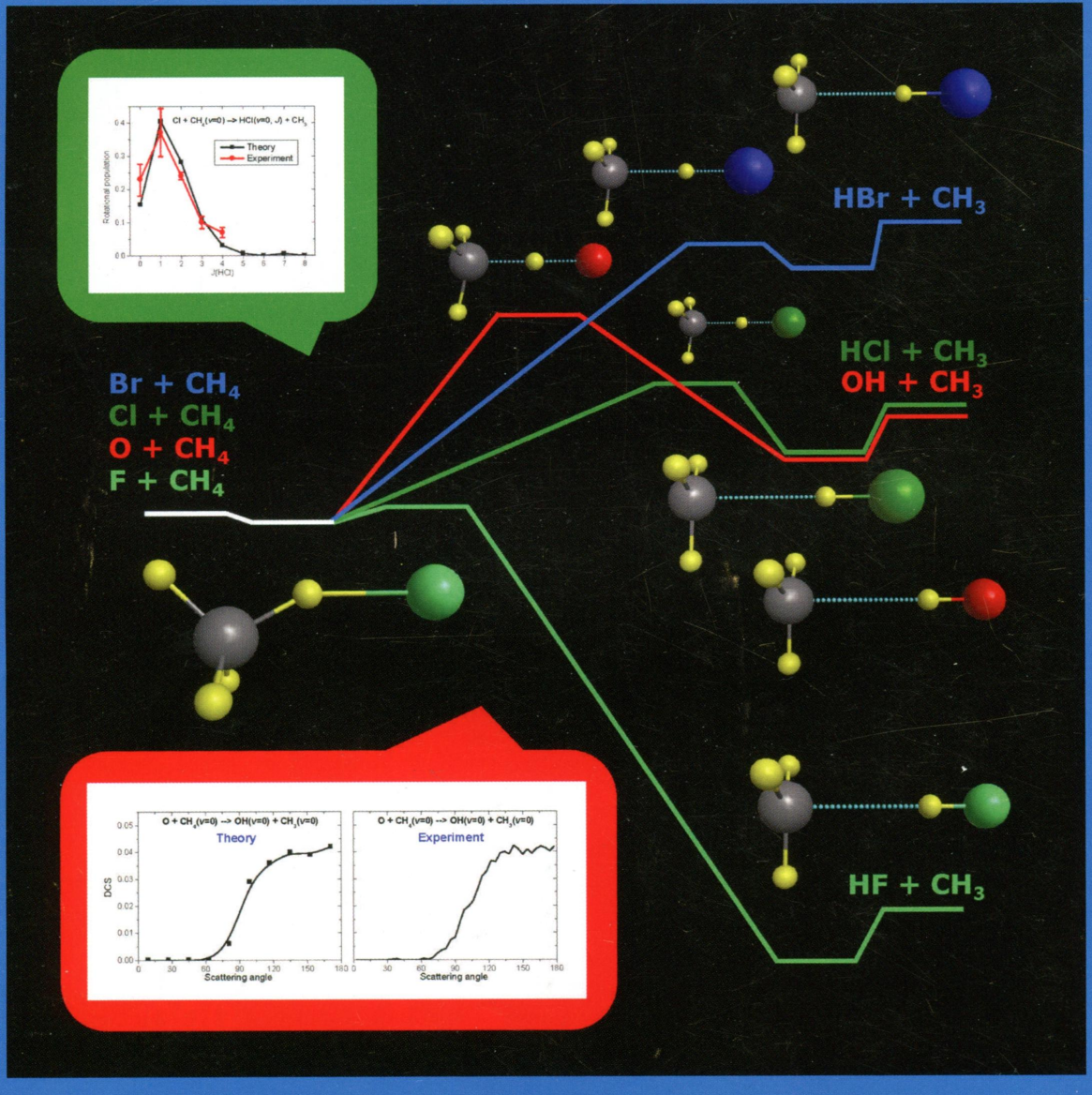

Schematic of the Energies of Indicated X + CH_4 Reactions from *ab Initio* Potential Surfaces (see page 5A)

ISOLATED MOLECULES, CLUSTERS, RADICALS, AND IONS; ENVIRONMENTAL CHEMISTRY, GEOCHEMISTRY, AND ASTROCHEMISTRY; THEORY

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ON THE COVER: Schematic of the energies of Br, Cl, O, and F + CH_4 reactions from high-level, *ab initio* permutationally invariant potential surfaces used in dynamics calculations. Top left graph from Czakó, G.; Bowman, J. M. Dynamics of the Reaction of Methane with Chlorine Atom on an Accurate Potential Energy Surface. *Science* **2011**, *334*, 343−346. Reprinted with permission from AAAS. Bottom left graphs adapted from Czakó, G.; Liu, R.; Yang, M.; Bowman, J. M.; Guo, H. Quasiclassical Trajectory Studies of the $O(^3P)$ + $CX_4(v_k = 0, 1) \rightarrow OX(v)$ + $CX_3(n_1n_2n_3n_4)$ [X = H and D] Reactions on an *ab Initio* Potential Energy Surface. *J. Phys. Chem. A* **2013**, *117*, 6409−6420. See page 2839.

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