

Abstract Submitted
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Threshold resonances in ultracold chemical reactions¹ ROBIN CÔTÉ, IONEL SIMBOTIN, SUBHAS GHOSAL, Department of Physics, University of Connecticut, 2152 Hillside Rd., Storrs, CT 06066, USA — We analyze the effects of near threshold resonances on the low energy behavior of cross sections for reactive scattering systems with reaction a barrier (*e.g.* Cl + H₂, D + H₂). We find an anomalous behavior when a resonance pole is very close to the threshold of the entrance channel. For inelastic processes, including reactive ones, the anomalous energy dependence of the cross sections is given by $\sigma \sim E^{-3/2}$. However, at vanishingly low energies, the standard Wigner's threshold behavior ($\sigma \sim E^{-1/2}$) is eventually recovered, but limiting to much narrower range of energies. When the cross sections are averaged to obtain rate coefficients, the anomalous behavior persists; indeed, we find an intermediate regime of ultralow temperatures, where the inelastic rate coefficients behave as $K \sim 1/T$.

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