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**Ultracold Reaction Rates of Triplet NaLi Molecules with Na Atoms in a Magnetic Field** REBEKAH HERMSMEIER, TIMUR TSCHERBUL, University of Nevada, Reno — Nearly all of the open-shell molecular radicals trapped in recent experiments (such as SrF, CaF, and NaLi) are chemically reactive, motivating the study of spin-dependent chemical reaction rates in the presence of external magnetic fields. We calculated the rates of the ultracold chemical reaction of triplet-state NaLi( $^3\Sigma$ ) molecules with Na atoms, including the fine and hyperfine structure of the reactants. To this end, we first determine the energy level structure of NaLi as a function of magnetic field. We then use coupled-channel statistical theory to calculate the reaction rates for the different hyperfine states of NaLi and Na. We examine the regimes where the chemical reactions can be most efficiently controlled by switching the hyperfine states and applying an external magnetic field.

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