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Optimal trapping wavelengths of Cs_2 and RbCs molecules in an optical lattice NADIA BOULOUFA, Laboratoire Aime Cotton, CNRS, Orsay, OLIVIER DULIEU, ROMAIN VEXIAU, MIREILLE AYMAR, Laboratoire Aime Cotton, CNRS, Orsay, France, JOHANN GEORG DANZL, MANFRED J. MARK, HANS-CHRISTOPH NÄGERL, Institut für Experimentalphysik und Zentrum für Quantenphysik, Universität Innsbruck, Austria — The present work aims at finding optimal parameters for trapping of Cs_2 and RbCs molecules in optical lattices, with the perspective of creating a quantum degenerate gas of ground-state molecules. We have calculated dynamic polarizabilities of Cs_2 and RbCs molecules subject to an oscillating electric field, using accurate potential curves and electronic transition dipole moments. We show that for some particular wavelengths of the optical lattice, called "magic wavelengths," the polarizability of the ground-state molecules is equal to the one of a Feshbach molecule. As the creation of the sample of ground-state molecules relies on an adiabatic population transfer from weakly-bound molecules created on a Feshbach resonance, such a coincidence ensures that both the initial and final states are favorably trapped by the lattice light, allowing optimized transfer in agreement with the experimental observation.

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