

Abstract Submitted
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Chemical synthesis of type I clathrates JAN GRYKO, SHARON BROOKS, MARY MILLWOOD, Jacksonville State University — We report synthesis of type I clathrates in a metathesis reaction between alkali metal (Na, K, Rb, and Cs) silicides (or germanides) and ammonium halides. In this reaction, clathrates such as $\text{Na}_8\text{Si}_{46}$ are formed. The byproducts are alkali halides, ammonia, and hydrogen. The purity of the clathrate depends strongly on pressure and temperature, with the best product formed at $t = 300$ °C and pressures 20 – 30 atm. In the same conditions, lithium silicides form only amorphous/nanocrystalline silicon (or germanium). The most interesting aspect of this approach is synthesis of mixed, silicon/germanium clathrates.

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