

HALOGEN FREE SYNTHESSES OF AMINOSILANES BY CATALYTIC DEHYDROGENATIVE COUPLING

ABSTRACT

Compounds and method of preparation of Si-X and Ge-X compounds (X = N, P, As and Sb) via dehydrogenative coupling between the corresponding unsubstituted silanes and amines (including ammonia) or phosphines catalyzed by metallic catalysts is described. This new approach is based on the catalytic dehydrogenative coupling of a Si-H and a X-H moiety to form a Si-X containing compound and hydrogen gas (X = N, P, As and Sb). The process can be catalyzed by transition metal heterogeneous catalysts such as Ru(0) on carbon, Pd(0) on MgO) as well as transition metal organometallic complexes that act as homogeneous catalysts. The -Si-X products produced by dehydrogenative coupling are inherently halogen free. Said compounds can be useful for the deposition of thin films by chemical vapor deposition or atomic layer deposition of Si – containing films.

[FIG. 2]