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Title:

The Production of Decarborane-14 from Diborane by Laser Induced Chemistry,

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Abstract:

Pure B10H14 can be produced in high yields at room temperature by laser induced chemistry (LIC). No polymer (which is always present in pyrolysis) was observed when the laser power was kept below a certain threshold (10 W/sq cm for the CO2 laser). Also, the B5H11 product is always present in pyrolysis; yet never observed in LIC synthesis. This research demonstrates that LIC is a new viable area of chemistry that can be used for cost-effective synthesis of large poly-atomic molecules as well as smaller ones. Also, it demonstrates that LIC can be used in a prominent role for the synthesis of high energy binder molecules, burning rate modifiers and fuel additives with a substantial cost-savings.

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