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| <p>During the past 10 years, work was carried out on the preparation of new and unusual simple and complex metal hydrides of the main group elements. Several new hydrides of propellant interest were prepared and the chemistry related to the preparation and reactions of the new hydrides, elucidated.</p> |                                                                             |                                    |

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### ABSTRACT

This is the final report of a 10 year (March 1, 1968-March 31, 1978) effort concerning the preparation of light metal hydrides of the main group elements. The purpose of this project was to prepare thermal and shock stable light metal hydrides of high calculated specific impulse ( $I_{sp} > 300$  sec.) for use as solid rocket propellants. The results of these efforts were reported each year in the annual report and in over 50 publications appearing in Inorganic Chemistry Journal. A list of these publications follows.

→ The metals specifically covered in this work <sup>were</sup> ~~are~~ lithium, beryllium, magnesium, zinc, aluminum, boron and copper. An effort was made to establish the fundamental chemistry leading to the preparation of new hydrides as well as the preparations themselves. Indeed, a number of serious errors in the literature were corrected and the basis for the chemistry of main group metal hydrides established. In addition, many new hydrides were prepared and characterized, some of which should have potential as solid rocket propellants, e.g.  $Li_3AlH_6$ ,  $Li_2BeH_4$ ,  $Li_5BeH_4$ ,  $Li_5CuH_6$ , etc. ↩

The author would be happy to answer any questions pertaining to this work at any time.

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