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Recovery of Pyrotechnic Ingredients Using Supercritical Fluids

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Abstract: Many pyrotechnics contain valuable resources which could be used in commercial applications, for example metals (e.g. magnesium, **aluminum**); metallic salts of copper, strontium, and **barium**; oxidizer (e.g. sodium nitrate, potassium perchlorate); binders such as viton, and dyes which have reclaimed value. The Navy is seeking technology that can recover the valuable ingredients from pyrotechnic flares and smoke munitions in an environmentally acceptable manner. This Phase I program studied the recovery of constituents from a Magnesium- Teflon-Viton (MTV) pyrotechnic material. The use of near critical liquid and supercritical carbon dioxide with acetone cosolvent to dissolve the Viton-A binder component was investigated. Viton-A was readily dissolved by carbon dioxide with acetone cosolvent. This key finding may form the basis for an environmentally friendly process for the recycling of pyrotechnic and other energetic materials.

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