Compositional diversity of binary near-Earth and main belt asteroids

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Composition of binary asteroids has important implications for their formation mechanism and impact hazard assessment. Constraining the composition can shed light on other physical parameters like albedo, bulk density, porosity and physical strength. Currently, it is possible to identify the surface mineralogy and estimate the mineral chemistry, mineral abundance, and petrologic history of binary asteroids using near-IR (0.75-2.5 pm) spectroscopic observations.

While no mineralogical characterization projects have been completed on the entire binary asteroid population to date, a vast database of visible and near-IR spectra of varying quality and wavelength coverage is currently available in the public domain. These databases can serve as a starting point to understand the compositional diversity among the binary asteroid population. Analysis of spectra from these databases could also help answer the following questions. Do asteroids with a certain composition dominate the binary asteroid population? Is there a relationship between composition and formation mechanism? Are there compositional differences between main belt and near-Earth binaries?