

Introduction. Low albedo class (or C-complex, the B, C, F, G types) asteroids are typically rather bland spectrally at visible-near infrared (VNIR) wavelengths. Roughly half of the low-albedo asteroids in the main belt exhibit an absorption near 3 μm , indicative of some type of hydration (OH and/or H₂O). Roughly half of the asteroids with the 3- μm feature also exhibit an absorption near 0.7 μm , due to a ferrous-ferric charge transfer transition likely resulting from aqueous alteration (the interaction of material with liquid water formed by melting of water upon a heating event) of iron-bearing phyllosilicates [1]. Some asteroids likely do not exhibit these features due to a history of heating that has been experienced at some point in the asteroid's evolution. **Despite having little spectral activity in the VNIR, all low-albedo asteroids exhibit a UV absorption** (or UV "dropoff") at wavelengths shorter than $\sim 0.5 \mu\text{m}$, attributed to a strong ferric oxide intervalence charge transfer (IVCT) transition (e.g. [2]).

C-complex asteroids have been classified as such due to spectral characteristics in the 0.44-0.92 micron range [3,4]. According to these classifications, B-types exhibit no UV dropoff, C-types show a weak- to-medium UV absorption shortward of 0.55 μm , and Cg-types show a strong UV absorption shortward of 0.55 μm ; Ch types are like C-types in terms of UV dropoff, and Cgh-types are like Cg-types. We are interested in understanding what changes the UV part of the spectrum, and what can we learn by observing deeper into the UV. Why is a stronger UV absorption seen in Cg and Cgh asteroids, and is this characteristic hydration-related? For most materials, the main cause of the UV absorption is metal-oxygen charge transfer absorptions; are changes in the UV dropoff strength and location related to iron content?

On a related note, carbon and carbonaceous compounds, though ubiquitous throughout the solar system, are not well understood on planetary surfaces due to carbon's spectral blandness at visible-near infrared (VNIR) wavelengths. In the UV, however, carbon compounds are spectrally active and spectrally variable, depending on the amount of processing (thermal, radiolytic) experienced by the surface (e.g. [5]). Thus, the UV is a key region in which we not only identify carbonaceous species but also track the level of processing of different surfaces [throughout the solar system]. We investigate UV-visible spectral trends among C-complex (presumably carbonaceous) asteroids to understand how spectral characteristics might be linked to composition and weathering.

Results. We combine IUE and ground-based data to create composite UV-visible spectra of a suite of low-albedo class (B, C, Ch, Cgh) asteroids. We investigate spectral trends with taxonomic type and compare with laboratory spectra of CM chondrites and minerals to look for clues behind compositional trends. We also compare with laboratory-measured mixtures and spectral mixing models of various phyllosilicates and opaques including amorphous carbon, graphite, magnetite and troilite (FeS) to investigate spectral trends. We find that 2-5% of opaque material intimately mixed with a phyllosilicate can approximate the overall albedo and spectral shape of our observed set of asteroids. The effect of the addition of the opaque material to the phyllosilicate is to dampen the UV absorption, making the UV slope less red and, in some cases, moving the absorption edge toward the blue.

References: [1] Vilas, F. (1994) *Icarus* 111, 456-467. [2] Vilas, F. and M. Sykes (1996). *Icarus* 124, 483-489. [3] Tholen, D. J. (1984) 1984. *Asteroid Taxonomy from Cluster Analysis of Photometry*. Doctoral thesis, University of Arizona. [4] Bus, S. & R. Binzel (2002) *Icarus* 158, 146-177. [5] Hendrix et al. (2016) *MaPS*, 51, 105-115