

TABLE 1. Comparison and explanation of the progression of spectral taxonomies.

Taxonomic System	Tholen (1984)	Gaffey (1993)	Bus (2002)	Bus-DeMeo (2009) (B-D)	Taxonomy Notes	Relevant Minerals and Possible Meteorite Analogs
Wavelength Range	0.33–1 $\mu\text{m}$	0.35–2.50 $\mu\text{m}$	0.45–0.90 $\mu\text{m}$	0.45–2.45 $\mu\text{m}$		
S-complex		SI SII SIII SIV SV SVI SVII	S Sa Sq Sr Sk Sl		Tholen: Defined only S. Gaffey: 7 mineralogic classes based on Band I center and Band II/Band I area ratio. Primarily separates olivine to orthopyroxene ratio. Bus: Separates based on strength of 0.9- $\mu\text{m}$ drop, indicative of 1- $\mu\text{m}$ band. B-D: Definition largely preserved from Bus. Now includes full 1- and 2- $\mu\text{m}$ feature in near-IR. Sl, Sk, and Ld are removed, Sv is added.	Minerals: olivine, pyroxene Meteorites: S(I): pallasites?, R chondrites, brachinites S(IV): many are ordinary-chondrite-like S(V): primitive achondrites? S(VII): basaltic achondrites
C-complex			B C Cb Cg Cgh Ch		Tholen: Primarily distinguished by the 0.3–0.5- $\mu\text{m}$ UV dropoff region. Bus and B-D do not cover this region, thus do not make these distinctions. Bus: Defined by UV dropoff and/or by 0.7- $\mu\text{m}$ Cgh, Ch feature. B-D: Definition largely preserved from Bus. Near-IR is largely degenerate.	Minerals: opaques, carbon, phyllosilicates, some have weak features indicating olivine, pyroxene Meteorites: carbonaceous chondrites (except CV), possibly impact melts from ordinary chondrites and HEDs?
X-complex			X Xc Xe Xk		Tholen: EMP are spectrally degenerate. Distinguished by high (E), med (M), and low (P) albedo. Bus: X class defined by shape of curve and/or 0.49- $\mu\text{m}$ Xe feature. B-D: Definition largely preserved from Bus. Near-IR is largely degenerate.	Minerals: M,P: opaques, carbon, low-Fe pyroxene. E: enstatite, oldhamite Meteorites: M,P: carbonaceous chondrites (not CV). M w/high radar albedo: irons, CB chondrites, silicate-rich irons E: enstatites
Other: End members, outliers			T D Q O R V A K L Ld		Definitions for each of these classes are relatively consistent among taxonomies as they are each spectrally distinct.	D: opaques, organics Q: mostly LL OCs O: pyroxene, olivine R: olivine, pyroxene V: HEDs, pyroxene, plagioclase feldspar A: pallasite, brachinite, R chondrites, olivine K: CO, CV, olivine L: CAI-rich, spinel-rich

A simple description of relevant minerals and meteorites for each class is presented. For meteorite and mineral details see *Burbine et al.* (2002).