TWO LARGE MOROCCAN MESOSIDERITES: NWA 1817/1878/1979/2042 AND NWA 1827/1879/1882/1912/ 1951/1982/3055.

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Discovery: Two different, relatively large mesosiderites assignable to classes B and C [1] were found in Northwest Africa during 2003. Samples of both finds were distributed by various Moroccan dealers, but locations are not known. Portions of each heterogeneous meteorite have been studied in several laboratories and assigned different numbers [2]; we have examined most of the individual fresh samples.

Samples: The first group of specimens (Class B, coarse grained, with large spheroidal metal grains) includes NWA 1817 (*Hupé/Oakes*), NWA 1878 (*Hupé*), NWA 1979 (*Boswell*), NWA 2042 (*Gregory*), and other material with a total known weight of at least 6.4 kg. The second group of specimens (Class C, finer grained, heterogeneous, with large orthopyroxene and some plagioclase macrocrysts) includes NWA 1827 (*Oakes*), NWA 1879 (*Hupé*), probably NWA 1882 (*Ralew*), NWA 1912 (*Farmer*), NWA 1951 (*Moroccan Imports*), NWA 1982 (*Fectay*), NWA 3055 (*Anon.*), and other material with a total known weight of at least 26.4 kg. NWA 1645 (*Farmer*) [2] possibly also is paired with these.

Petrography: NWA 1817 and pairings consist of subequal amounts of metal and silicates in a coarse grained, unbrecciated, plutonic igneous texture. The metal (about 40 vol.%) is concentrated in spheroidal clusters interspersed with more silicate-rich material, and consists mainly of kamacite with rounded taenite grains and rare schreibersite. The remainder consists mainly of orthopyroxene ($Fs_{30-31}Wo_2$, FeO/MnO = 23.2-30.1) with lesser amounts of anorthitic plagioclase (An_{90-93}), silica polymorph, troilite, chromite and merrillite; rare angular olivine grains (~Fa_{40}, FeO/MnO = 42.3) and clasts of gabbroic eucrite and diogenite also are present. In contrast NWA 1827 and pairings, while also exhibiting igneous textures, are generally medium grained, but with distinctive large grains of glassy orthopyroxene. Orthopyroxene predominates in these samples, with about 10 vol.% metal (kamacite), troilite, chromite, merrillite, silica polymorph and sparse, large plagioclase grains ($An_{89-95.5}$). Some large orthopyroxene macrocrysts (which may derive from diogenitic precursors) are more magnesian ($Fs_{16.2}Wo_{0.8}$, FeO/MnO = 34.8) than the predominant medium-sized orthopyroxene grains ($Fs_{23-31}Wo_{2-3}$, FeO/MnO = 29.7-32.7), which are more typical of mesosiderites. Some plagioclase-poor portions of these samples (such as NWA 1827, NWA 1982) could be misidentified as "metal-rich diogenite".

References: [1] Hewins, R. (1988) *Meteoritics 23*, 123-129; [2] Russell, S. et al. (2004) *Meteorit. Bull. 88*.