

Caput Mortuum pigment: a magnetic investigation

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Hematite-based purple dye called Caput Mortuum has been often reported in the context of pigments of art history. Recently, different groups proposed it to be made of violet hematite (α -Fe₂O₃), with the possible presence of secondary phases such as kaolinite [Al₂Si₂O₅(OH)₄]. In this study, different Fe-rich compounds were selected as starting materials and by careful morpho-structural and mainly magnetic characterization the possibility of a natural origin has initially been explored. Also, the likelihood to achieve a violet form of hematite without modern synthesis has been investigated.

X-Ray Diffraction (XRD), show good crystallinity of the samples with increasing particle size with the increase annealing temperature. This is confirmed by Transmission Electron Microscopy (TEM), that also indicate a tendency to the particles to be agglomerated. DC magnetic measurements shows clear difference among natural and synthetic samples. Synthetic one shows canonical antiferromagnetic behavior, with a linear field dependence of the magnetization. In natural samples the antiferromagnetic component is superimposed to a weak ferromagnetic one, due to some impurities (i.e. magnetite or maghemite) or most probably, to the presence of some uncompensated spins.