

GOLD IN ORGANIC MATTER, MALDON, VICTORIA, AUSTRALIA

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Abstract

Submicroscopic mixtures of metallic gold and solid hydrocarbons form aggregates of up to 100 nm in fractures and vugs in loellingite from gold-rich samples from Maldon, Australia. Electron microprobe analyses show that solid hydrocarbons contain about 1 wt percent S and Fe, up to 3 wt percent O, and several wt percent Au. Infrared microscopy indicates that the solid hydrocarbons comprise mainly conjugated benzene rings with short-chain functional groups composed of carbonyl groups (C=O), CH₃, CH₂, and OH. Metals (Fe and Au) are suggested to be bound to aryl ketones, or may be bound to hydrocarbons by S-functional groups. It is proposed that metal-bearing solid hydrocarbons are replaced by siderite, producing spectacular nebular inclusions of minute gold grains in replacive carbonate forming veinlets in the host quartz.