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## **PREG-ROBBING CARBON IN THE PROCESSING OF GOLD-BEARING ORES: DEFINITIONS, ANALYTICAL METHODOLOGY AND CHARACTERIZATION**

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Certain precious-metal mineral deposits, including the majority of the Carlin-type gold deposits of northeast Nevada, are hosted in calcareous sedimentary rocks that contain naturally-occurring carbonaceous material. Depending on the geological characteristics of the deposit (i.e., original C content, sedimentary rock types, thermal history, extent of alteration and mineralization, etc.) carbon can range in maturity from poorly-ordered amorphous phases to highly-ordered crystalline graphite. The optimal processing of these ores can be impeded the presence of ‘preg-robbing carbon’, which is defined as carbonaceous material that preferentially absorbs gold and gold-cyanide complexes. This absorption can be a temporary phenomenon (termed ‘preg-borrowing’), and the gold and gold-cyanide species can be reabsorbed onto activated coconut carbon during processing. Other minerals within the deposits exhibit preg-robbing and preg-borrowing characteristics but to a much lower extent than carbon.

A common laboratory technique to determine preg-robbing affinity is to measure the amount of gold absorbed onto the ore from a known gold-spiked solution. This and other similar tests can readily determine the relative preg-robbing nature of the ore but do not yield any specific information on the chemical and physical nature of the carbon. Other analytical techniques, such as infrared spectroscopy, laser Raman spectroscopy and carbon isotope analyses, yield information relevant to the determination of chemical structural characteristics of preg-robbing and non preg-robbing carbons, how and where gold is absorbed onto carbon, what the surface processes may be operative, and what steps can be taken to mitigate preg-robbing behavior.

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