Graphite Deposits: Origin and Economic Significance

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Executive Summary
- Graphite deposits are among the most economically significant mineral deposits in the world, with applications in a wide range of industries.
- Origin of graphite deposits is complex and involves multiple processes, including metamorphism, metasomatism, and sedimentary derivation.
- Economic significance of graphite is high due to its diverse applications in industries such as energy, electronics, and automotive.

Introduction
- Graphite is a carbon allotrope with high electrical and thermal conductivity, making it a valuable material in various applications.
- Origin of graphite deposits includes metamorphic, sedimentary, and vein deposits.

Geology of Graphite Deposits
- Metamorphic graphite deposits: Formed during metamorphism of organic-rich sediments.
- Sedimentary graphite deposits: Result from the diagenesis of graphite-bearing sediments.
- Vein graphite deposits: Formed by replacement of wall rock by graphite-rich fluids.

Origin of Graphite Deposits
- Metamorphic origin: Where graphite forms by transformation of organic material into graphite during metamorphism.
- Sedimentary origin: Where graphite forms from the precipitation of graphite from C-O-H fluids in sediments.
- Vein origin: Where graphite forms as a result of the replacement of wall rock by graphite-bearing fluids.

Graphite Occurrences in British Columbia
- Distribution of graphite deposits in British Columbia is widespread, with deposits occurring in various geological settings.
- Economic significance of graphite deposits in British Columbia is high due to the presence of large deposits.

References

Fig. 1. Crystalline flake graphite deposits. (a) Discrete and disseminated crystalline flake graphite in metavolcanics, Batinic Arm, British Columbia. (b) Vein graphite within serpentinite, Rivers-Inlet, British Columbia. (c) Crystalline flake graphite in metasediments, Midnight Lake, British Columbia.

Fig. 2. Sedimentary graphite deposits. (a) Microcrystalline graphite from the Steep Rock–Ravine Creek prospect, Yukon. (b) Vein graphite from the Asbury Graphite mine, Quebec.

Fig. 3. Enriched zones (porphyroblastic marble) contain from <0.5-25% graphite and contain 2-10 mm graphite. Enriched zones (granoblastic) generally contain <0.5-3% graphite. Silicates account for <5% per volume.

Fig. 4. Metamorphic grade: (a) Metamorphic grade: (b) Metamorphic grade: (c) Metamorphic grade: