

Deep-sea spherules from Middle Triassic chert in the Chichibu terrane, Japan

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We report the discovery of deep-sea spherules from radiolarian chert succession, considered as having accumulated on the ocean floor in an open-ocean realm. Spherules were discovered from the Middle Triassic radiolarian chert succession of the Chichibu terrane on Ajiro Island, eastern Kyushu, southwest Japan. Our microscopic and SEM examinations recognized small black magnetic spherules embedded in siliceous claystone partings within radiolarian chert beds. Based chiefly upon the textures and chemical compositions, three spherules types were discriminated: iron-type (I-type), silicate-type (S-type), and glass with magnetite (G-type) spherules. I-type spherules are characterized by polygonal, dendritic, and interlocking textures. They are rich in Fe with subordinate amount of Ni. S-type spherules have cryptocrystalline and porphyritic textures and consist mostly of Mg, Si, and Fe with varying amounts of Al, K, Ca, and Ni. G-type spherules are characterized by dendritic magnetites in the silicate glass. Although most of the Triassic spherules are degraded by chemical alteration, their textures and major element compositions are similar to those of the deep-sea spherules.