

## **Framboidal pyrite formed in association with organic matters and domain structure of stacked microcrystals**

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Framboidal pyrite occurs widely in geological environments. It is reported that they may form through some precursor stages. However, the details of the formation process have not been clarified yet. We examined formation processes of framboidal pyrites from the standpoint of TEM-SEM mineralogy and mineralization associated with organic matters. Specimens used are muddy sediments of 70.4 m Holocene drilling core specimens, at Shirone, Niigata Prefecture, Japan. Gypsum and vivianite sometimes occurred. The framboid are classified into isolated type and aggregated type in shape. The latter is similar to wood flakes in shape and also contains small framboids ( $2\sim 10\mu\text{m}$ ). The aggregated type may have formed under the action of sulphate-reducing bacteria. SEM observations showed that internal microcrystals of framboids are arranged regularly. The regular arrangement is in the form of Body-Centered type packing of the microcrystals. Microcrystals are fundamentally octahedra in shape and are linked to each other along  $[110]$  direction. Some microcrystals show characteristic forms of penetration twin. Domain structures which consist of regularly arranged microcrystals are found. Such regular arrangements are not found in tiny framboids ( $<10\mu\text{m}$ ). Therefore, these structures may have formed during growth of framboids. Greigite framboids and small amorphous FeS spherules ( $80\sim 400\text{\AA}$ ) were also found in wood flakes. These may be the most primitive precursor stage of the framboids.