EPMA characterization of the Fe-Cu-Sn mineralisation at Waterfall Mine, Pelepah Kanan, Johor

TEH GUAN HOE AND LEE HENG POH

Geology Department
University of Malaya
50603 Kuala Lumpur

The electronprobe microanalyser (EPMA) is used, for the first time locally, to characterise the Fe-Cu-Sn mineralisation at the Waterfall Mines, Pelepah Kanan, Johor.

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Evidences from the field, reflected light microscopy and EPMA studies show that the mineralisation at Pelepah Kanan is essentially a replacement body within a calc-silicate sequence or skarn of early magnetite-cassiterite-fluorite-quartz (Fe-Sn) mineralisation that is intruded by a later phase of copper mineralisation and that both these were later cut by an even later hydrothermal cassiterite-K-feldspar-quartz vein swarm along fissures, joints and faults.

The EPMA was also instrumental in identifying a number of new minerals that have yet to be reported from Pelepah Kanan and they include native bismuth, tennantite (Cu_3AsS_3), wittichenite (Cu_3BiS_3), cuprite (Cu_2O), native Cu and gold.

The variable pinkish nature of the feldspars in the cassiterite-K-feldspar-quartz veins was confirmed to be due to the alteration of Fe-Mn-O material infilling cleavages in the feldspars. In addition EPMA mapping of the dark bands in highly pleochroic cassiterites show that they contain higher amounts of Fe.

Finally EPMA mapping of tailings samples show that they are worth reassessing as a large portion of them still have high iron oxide contents (80-90%).

Peralatan EPMA (electronprobe microanalyzer) digunakan, kali pertama secara tempatan, untuk pencirian pemineralan Fe-Cu-Sn di Waterfall Mine, Pelepah Kanan, Johor.

Bukti-bukti lapangan, kajian mikroskopi cahaya terpantul dan EPMA menunjukkan bahawa pemineralan di Pelepah Kanan adalah jasad penggantian didalam jujukan kalk-silikat atau skarn yang mengandungi pemineralan awal magnetit-kasiterit-fluorit-kuarza yang direjahkan kemudian oleh pemineralan tembaga dan akhirnya kedua-dua pemineralan ini dipotong oleh telerang-telerang hidroterma kasiterit-K-feldspar-kuarza yang lebih lewat yang isikan fisur, kekar, dan sesar.

EPMA juga peralatan yang menentukan beberapa mineral baru yang belum dilaporkan di Pelepah Kanan, iaitu bismut asli, tennantit (Cu_3AsS_3), wittichenit (Cu_3BiS_3), cuprit (Cu_2O), tembaga asli dan emas.

Warna merah jambu feldspar didalam telerang kasiterit-K-feldspar-kuarza disahkan oleh kajian EPMA dihasilkan oleh perubahan bahan Fe-Mn-O khususnya oksida besi yang isikan ira-ira feldspar.

Kajian pemetaan EPMA menunjukkan bahawa jalur-jalur gelap didalam kasiterit yang amat pleokroik disebabkan oleh kandungan Fe yang lebih tinggi.

Akhirnya pemetaan EPMA sampel tailings menunjukkan bahawa mereka harus dikajikan semula oleh sebab bahagian besar mereka masih mengandungi oksida besi yang tinggi (80-90%).