

Research Advances

New Discovery of Shizhushan Superlarge Wollastonite Deposit in Xinyu City, Jiangxi Province

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Objective

The Mengshan area of the Xinyu City, Jiangxi Province is an important wollastonite production base in China. As early as the 90s of the 20th century, more than ten medium - to small-sized wollastonite deposits, such as the Yueguangshan and Caofangmiao Deposits were discovered in the outer contact zone of the Mengshan rock mass. After that, no more progress was achieved in wollastonite prospection. In 2016, the project funded by the Geological Prospecting Fund of Jiangxi Province made significant breakthroughs in the “General Survey of the Shizhushan Wollastonite Ore in the Yushui District and Zhangmuqiao Wollastonite Ore in Shanggao County, Xinyu City, Jiangxi Province” in the Mengshan area. The new discovered Shizhushan Wollastonite Deposit has a scale of 50 million tons and its resources scale far exceeds that of the Seeleys Bay Wollastonite Deposit discovered in Canada. It becomes the largest high-quality wollastonite

deposit in China and even in the world. The discovery of the Shizhushan Wollastonite Deposit expands the prospecting space of the wollastonite deposit in Mengshan area, Jiangxi Province and provides new prospecting ideas and directions.

Methods

In 2013–2015, the project team of the Geological Prospecting Fund of Jiangxi Province prospected coal in Dongcun Village, Fenyi County and discovered a wollastonite ore body in the Maokou Formation in the lower part of the Leping Formation. In 2016, the Administration of Geological Prospecting Fund of Jiangxi Province adjusted the ore prospecting idea and direction. As a result, the concealed wollastonite ore became the most important prospecting target in the Shizhushan area on the southern side of Mengshan rock mass (Fig. 1A, B). As of March 2018, more than 40 boreholes had been

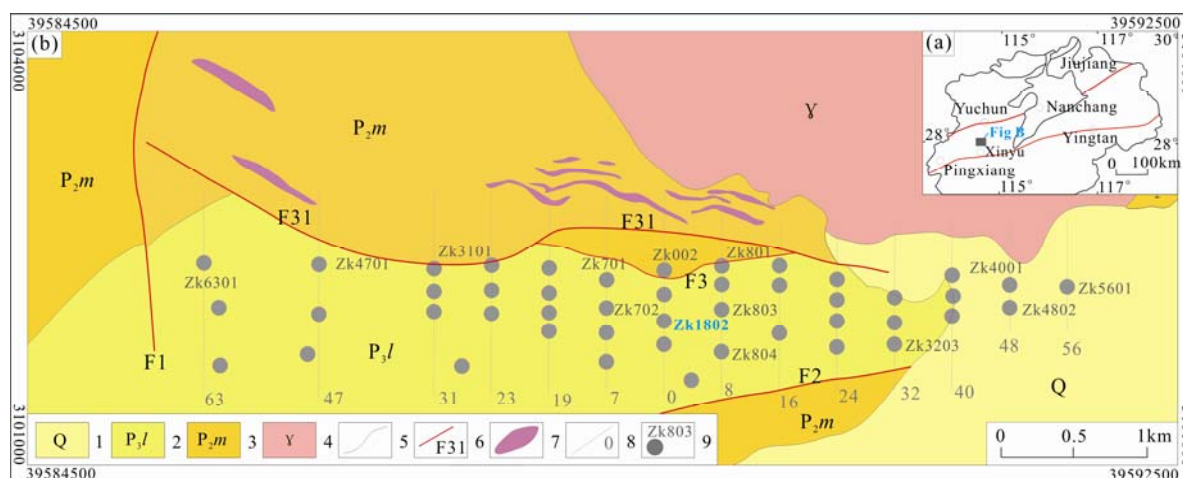


Fig. 1. Geotectonic location and geological sketch map of the Shizhushan mining area.

(a), Location map of the mining area; (b), Geological sketch map of the mining area. 1. Quaternary; 2. Leping Formation; 3. Maokou Formation; 4. biotite granites; 5. geological boundary line; 6. fault and number; 7. wollastonite orebody; 8. prospecting line and number; 9. borehole and number.

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drilled in the Shizhushan mining area, with a total footage of more than 25,000 meters (Fig. 1B).

Results

The ore-bearing strata in the Shizhushan mining area are composed of chert nodules, chert-banding limestone and marbleized limestone in the Maokou Formation. The ore-forming rock mass is Mengshan medium- and fine-grained porphyritic biotite granite.

A total of more than 10 layered and lenticular wollastonite ore bodies were discovered in the Maokou Formation in the mining area, with trend of east-west direction, tendency of south direction, and dip angle of 20–40°. No. II and No. VIII ore bodies are the main ore bodies. No. II ore body extends more than 4800 m in trend and more than 1300 m in tendency. The ore body is of 8.90–22.78 m thick with an average thickness of 14.14 m. The resource volume exceeds 80 million tons, with the wollastonite mineral content of more than 48 million tons. The wollastonite content accounts for 53.66%–72.21%, with an average of 60.86%. No. VIII ore body extends more than 1000 m in trend and more than 600 m in tendency. The ore body is of 2.48–50.86 m thick, with an average thickness of 14.67 m. The resource volume exceeds 10 million tons, with the wollastonite mineral content of more than 6 million tons. The wollastonite content accounts for 51.49%–70.04%, with an average of 61.80%.

The ore minerals are dominated by wollastonite, followed by calcite, diopside, garnet, and quartz. Wollastonite is white, which has mainly flake and fibrous shape (Fig. 2), followed by granular and radial shape. The chemical compositions of the ores are shown in appendix 1.

Conclusion

The Shizhushan wollastonite deposit has the largest



Fig. 2. Photograph of wollastonite ore, borehole zk 801, 208 m.

amount of resources in the world. No. II and VIII ore bodies are the main ore bodies in the mining area. The ore resources exceed 90 million tons, with minerals of more than 54 million tons. The average content of wollastonite mineral is about 60%.

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Appendix 1 Chemical compositions of the ores of the Shizhushan mining area (wt%)

Term	CaO	SiO ₂	MgO	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	CO ₂
Range	42.13–49.22	39.66–54.62	0.66–7.68	0.18–1.40	0.04–0.09	0.02–0.07	0.71–5.95
Average value	43.87	48.06	1.61	0.52	0.32	0.03	7.5