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**Xiaochun Wen**
University of Science and Technology Beijing, China

## Efficient Separation of Lead and Antimony Metals from the Pb-Sb Alloy by Super-Gravity Technology

The Pb-Sb alloy was obtained during the pyrometallurgical processing of jamcsonite ($Pb_4FeSb_6S1_4$). To effectively separate lead and antimony metals from the Pb-Sb alloy, a novel approach of super-gravity technology was introduced in the current study. Super-gravity technology plays a significant role in enhancing mass transfer and phase migration of heterogeneous phases as the interfacial tension between the two different phases became insignificant. The effect of the super-gravity field on Pb-Sb alloy was remarkable, and the corresponding mechanism of filtrating was discussed in detail. With the help of scanning electron microscopy-energy dispersive spectroscopy, metallographic microscopy and X-ray diffraction methods, the results demonstrated that the lead phase migrated to the bottom of the sample along the super-gravity direction, whereas almost of the antimony-rich phase accumulated along the opposite direction. The Pb-Sb alloy was separated effectively by the filter in the super-gravity field, and the separating efficiency increased with the increasing of the gravity coefficient with the range of $G \geq 100$, After the separation of super-gravity at 533K (260°C), the gravity coefficient $G = 600$ and $t = 5$ minutes, the mass fraction of Pb in the filtrated lead phase reached 85 wt pct, which was close to the theoretical value 88.8 wt pct based on the Pb-Sb alloy's phase diagram, and the mass fraction of Sb in the residued antimony-rich phase exceeded 90 wt pct.

### Biography

Xiaochun Wen is studying his PhD at the age of 27 years and majoring in Metallurgical Engineering with the State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing, China.

james365183262@163.com