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真空蒸馏加剂除铅制备高纯铋

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Preparation of High-Purity Bismuth by Reagent Deleadization with Vacuum Distillation

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摘要 从理论上分析了用真空蒸馏分离精铋中各杂质和通过加硫、加氯除铅的可行性.在真空炉内进行了精铋加剂除铅的实验研究,考察了加剂量、蒸馏温度、残压和蒸馏时间等4个因素对除铅的影响,得到了最佳工艺条件:加硫除铅,蒸馏温度控制在1 073 K,每克精铋加硫0.02 g,可将含铅 3.0×10^{-5} 的精铋中的铅降到 2.1×10^{-7} ,脱铅率约为99.3%;氯化除铅,蒸馏温度控制在1 023 K,每克精铋加氯化铜0.06 g,可将含铅 3.0×10^{-5} 的精铋中的铅的含量降到 2.4×10^{-7} ,脱铅率约为99.2%.精铋中的其他杂质也可在一定条件下通过真空蒸馏有效除去,均达到“99.999%”高纯铋的要求.

关键词: 真空蒸馏 加剂 除铅 金属铋 高纯

Abstract: The feasibility of separation of impurities in refined bismuth and reagent deleadization with vacuum distillation is studied theoretically. Experimental studies on reagent deleadization were carried out in vacuum and the influence of various factors, including amount of reagent, distillation temperature, vacuum degree and distillation time on the deleadization are inspected; then an optimal technical condition is achieved to be the following: as to sulphur deleadization, addition of sulphur is about 0.02 g/g of refined bismuth, at distillation temperature of 1 073 K, lead content in refined bismuth decreases from 3.0×10^{-5} to 2.1×10^{-7} , and the deleadization rate is about 99.3%; as to chloridized deleadization, addition of copper chloride is about 0.06 g/g of refined bismuth, at distillation temperature of 1 023 K, lead content in refined bismuth decreases from 3.0×10^{-5} to 2.4×10^{-7} , and the deleadization rate is about 99.2%. Other impurities in refined bismuth can be also removed effectively under certain conditions, the content of bismuth has reached the level of “99.999%” with vacuum distillation.

Key words: vacuum distillation; reagent deleadization metal bismuth; High-purity

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