



论文摘要

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Bi(III)-X(Cl⁻, NO₃⁻)-H₂O体系热力学平衡研究

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摘要: 为确定Bi(III)-X(Cl⁻, NO₃⁻)-H₂O体系中各固相稳定存在的pH范围, 运用同时平衡原理和质量平衡原理对Bi(III)-X(Cl⁻, NO₃⁻)-H₂O体系进行了热力学分析和计算, 在此基础上绘制了Bi(III)-X(Cl⁻, NO₃⁻)-H₂O体系在25℃时的各种沉淀物的平衡浓度对数-pH图, 确定了各种固相沉淀物稳定存在的pH值范围. 结果表明: 溶液中铋离子和氯离子(硝酸根离子)的浓度及溶液的pH值是影响各固相稳定存在的重要参数. 由热力学图可得出: 可以直接从溶液中沉淀得到Bi₂O₃; 要得到高纯度的BiOCl或BiONO₃必须严格控制溶液的pH范围. 这为铋的湿法冶金过程和化工产品的湿法生产过程提供了理论依据.

关键字: Bi(III)-X(Cl⁻, NO₃⁻)-H₂O体系; 热力学平衡; Bi₂O₃; BiOCl; BiONO₃

Thermodynamic equilibrium study of Bi(III)-X(Cl⁻, NO₃⁻)-H₂O system

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Abstract: In order to identify the pH ranges of the stabilization zone of each solid in Bi(III)-X(Cl⁻, NO₃⁻)-H₂O system, the concentration balance principle and mass balance principle were applied to the thermodynamic analysis and calculation of Bi(III)-X(Cl⁻, NO₃⁻)-H₂O system, based on which the diagrams of the logarithm of equilibrium concentration of series precipitation at 25°C pH of Bi(III)-X(Cl⁻, NO₃⁻)-H₂O system were drawn, and the stable existing regions were analyzed and studied. The results show that c⁰(Bi³⁺), c⁰(Cl⁻), c⁰(NO₃⁻) and pH were the important factors to the stabilization zone of each solid. From thermodynamic diagrams it could be seen that Bi₂O₃ can be obtained from the solution directly, and if we want to get highly purified BiOCl or BiONO₃ the pH ranges must be controlled strictly. Which provides an important theory basis for the process of the hydrometallurgy and hydrometallurgical production of chemical products of metal bismuth.

Key words: Bi(III)-X(Cl⁻, NO₃⁻)-H₂O system; thermodynamics equilibrium; Bi₂O₃; BiOCl; BiONO₃

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