

稀土(III)三硬脂酸盐LB膜的制备及结构研究

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摘要 用直接在 $5 \times 10^{-5} \text{ mol} \cdot \text{dm}^{-3}$ 稀土(III)氯化物水溶液的液面上铺展稀土(III)三硬脂酸盐(简称LnSt~3)的方法,在疏水光学玻璃片上连续沉积了44层以上的含稀土(III)(La、Nd、Sm、Eu、Tb)硬脂酸盐LB膜,转移比为0.7-0.8。低角度X射线衍射($2\theta=0.3-14^\circ$)结果表明,膜的结构为高度有序的层状结构,相邻稀土离子面的间距为4.7-4.8nm。X射线光电子能谱(XPS)证实了五种膜中分别含有La、Nd、Sm、Eu和Tb元素。此外,还对LnSt~3LB膜进行了红外光谱考察,表明在亚相中加入一定浓度的稀土离子能有效地抑止界面上LnSt~3的水解作用,为制备含稀土(III)离子的优质LB膜提供了依据。

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Investigation on preparation and structure of LB films for rare- earth tristearates

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Abstract The LB films of rare-earth (La, Nd, Sm, Eu, Tb) tristearates were prepared by means of spreading them directly on the solutions containing $5 \times 10^{-5} \text{ mol} \cdot \text{dm}^{-3}$ corresponding rare-earth trichlorides. The numbers of layers of various rare-earth tristearates could be formed up to 44 on a plate of hydrophobic glass at $25 \text{ mN} \cdot \text{m}^{-1}$, with a transfer ratio of 0.7-0.8. X-ray photoelectron spectroscopy (XPS) verified the presence of La, Nd, Sm, Eu and Tb respectively in corresponding films. IR suggested that no hydrolysis took place in the process of deposition. X-ray diffraction of films in low angle region ($0.3-14^\circ$) showed that the films are of periodic layered structure, the space of adjacent face of rare-earth ions is 4.7-4.8nm. According to the area-time curves in the deposition of rare-earth tristearates, there may be a change of film's type.

Key words [L-B MEMBRANE](#) [STEARATE](#) [RARE EARTH](#) [STEARIC ACID FILM](#) [SEDIMENTATION](#) [X-RAY DIFFRACTION ANALYSIS](#) [INFRARED SPECTROPHOTOMETRY](#)

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