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PROCEEDINGS

LANTHANUM: PREPARATION OF SPEC PURE STANDARD AND SYNTHESIS OF PEROXIDE

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Abstract

The following studies are presented: Preparation of lanthanum oxide for use as spec pure standard and synthesis and characterization of lanthanum peroxide. Using the fraction precipitation and cationic ion exchange techniques, with EDTA as eluent, it was possible to obtain pure lanthanum oxide $\geq 99.9\%$, whose Impurities were in the same level as in the imported standard. The yield for the combined techniques was reasonable high ($\geq 80\%$). The raw material in the form of mixed rare earth carbonate (La_2O_3 45%) comes from by commercial rare earth concentrate. Emphasis was given to the analytical control to assure the purity of $\text{La}_2\text{O}_2 \geq 99.9\%$ by spectrophotometry and mass spectrometry. A study was made for the optimization of dissolution lanthanum carbonate, from the lanthanum spec pure standard obtained here, as function of the concentration of ammonium carbonate and ammonium carbonate\ammonium hydroxide searching the maximum solubilization of the lanthanum carbonate. The lanthanum peroxide was prepared by the addition of hydrogen peroxide to the complexed soluble lanthanum carbonate. These studies included also the determination of active oxygen, the total lanthanum oxide by gravimetry and complexometry and the C, H, O contents by microanalysis. The peroxide was also investigated by infrared spectroscopy and thermal analysis. The analytical data collected allowed to conclude that the stoichiometric formula for the peroxide is $\text{La}_2\text{O}_2(\text{CO}_3)_2 \cdot 1.25\text{H}_2\text{O}$. References

- [1] Queiroz, C.A.S et al, Brazilian Journal of Radiation Sciences, 9, (2021) 01-14.
- [2] Queiroz, C. A. S. et al., Journal of Energy and Power Engineering. 9, (2015) 616-621.
- [3] Queiroz, C.A.S et al. Journal of Alloys and Compounds, 374, (2004) 401-404.