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Determination of Interstitial Oxygen Atom Position in $U_2N_{3+x}O_y$ by Near Edge Structure Study

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Abstract: The determination of interstitial oxygen atom site in $U_2N_{3+x}O_y$ film could facilitate the understanding of the oxidation mechanism of α-U_2N_3 and the effect of $U_2N_{3+x}O_y$ on anti-oxidation. By comparing the similarities and variances between N K edge and O K edge electron energy loss spectra (EELS) for oxidized α-U_2N_3 and UO_2, the present work looks at the local structure of nitrogen and oxygen atoms in $U_2N_{3+x}O_y$ film, identifying the most possible position of interstitial O atom.

Key words: Uranium oxy-nitride, EXAFS, NEXAFS, ELNES

1. Introduction

Due to its good mechanical performance and corrosion resistance, α-U_2N_3 modified layer has been reported to be a promising anti-oxidation layer for metallic uranium[1-4]. However, Refs