



**HYDROGEN PRODUCTION BY USING ALKALINE TANTALATES (A:NaTaO₃, A = La and Sm)
PREPARED BY SOL-GEL METHOD**

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ABSTRACT

The alkaline tantalates A:NaTaO₃ (A= La and Sm) have been prepared by sol-gel method in order to improve their physicochemical and photocatalytic properties in comparison with those prepared by the conventional method. By X-ray diffraction it was detected that these alkaline tantalates prepared by sol-gel showed the perovskite-type crystalline structure. Additionally, because of their small size particles (<100 nm), their specific surface area was around 22 m².g⁻¹, which contributes to show a remarkable photocatalytic activity in water splitting reaction (160 μmol.h⁻¹) under UV light irradiation. In order to improve their photocatalytic properties, alkaline tantalates were impregnated with metallic oxides, NiO, RuO₂ and PtO in different weight ratio (0.2, 0.6 and 1% wt). Results indicate that La:NaTaO₃ impregnated with RuO₂ (0.2% wt) increased its photocatalytic activity in almost 5 times in comparison with the non-impregnated sample. On the other hand, when alkaline tantalates were tested in water splitting reactions under different pressures (from 100 to 500 torr), activity decreased when pressure increased; however there is not a significant diminish in the hydrogen production.

Keywords: Alkaline tantalates, Hydrogen, NaTaO₃, UV light, sol-gel