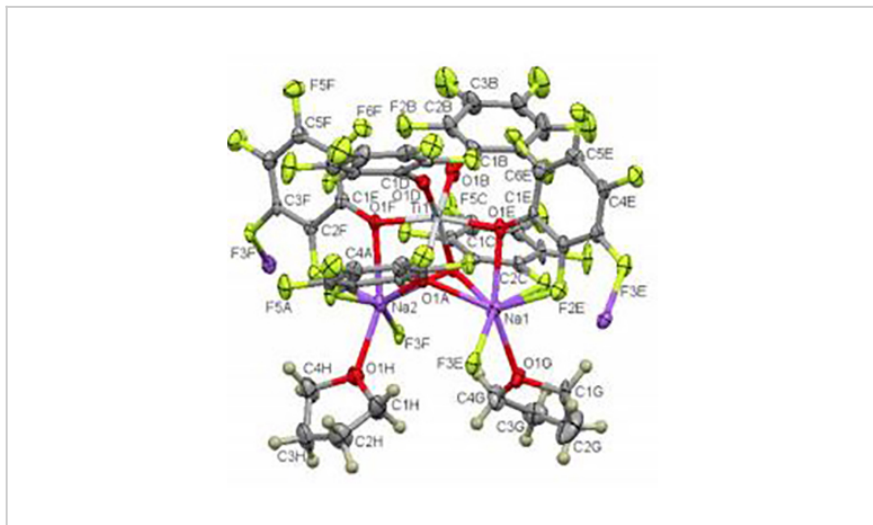


Synthesis of Double Alkoxide Titanates for Preparation of M₂TiO₃

ID# 2019-4885



Structure of the Na₂Ti(OC₆F₅)₆.THF₂

Technology Summary

New transition metal fluoralkoxide complexes have been synthesized. Specifically, the compound Na₂Ti(OC₆F₅)₆.THF₂ and Ti(OC₆F₅)₄.THF₂ have been synthesized and characterized via spectroscopic methods and a single crystal X-ray diffraction study. The target materials were prepared by high temperature combination of TiO₂ and M₂O, where M= Li, Na, etc. This approach reduces the temperature required for synthesis and provides molecular level control over the stoichiometric ratio of the metal ions. This method would also provide a way to form thin layers of lithium and sodium titanates which could be useful for preparation of electrode materials in batteries.

Application & Market Utility

Fluorinated alkoxide ligands provide the steric control associated with traditional alkoxide ligands, but have electron withdrawing properties that provide metal complexes with enhanced Lewis acidity. Many of these compounds may be useful for the preparation of titanium oxide materials by way of sol-gel hydrolysis.

Next Steps

Prepare and fully characterize more compounds of the group M₂TiO₃. Seeking licensing.

TECHNOLOGY READINESS LEVEL

1-3

Seeking

Investment | Licensing | Research

Keywords

- double alkoxides
- single source precursor
- lithium titanate
- sol-gel process
- electrode materials

Researchers

William G. Van Der Sluys

Assistant Teaching Professor, Chemistry

[Online Bio](#)

Originating College

College of Engineering

Office of Technology Management Contact

Swope, Bradley
bas101@psu.edu
814-863-5987



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at invent.psu.edu.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.