

AN INNOVATIVE METHOD TO PRODUCE UHMWPE

Omer Yahya Bakather^a and Mamdouh Ahmad Al-harhi^a

^a Department of Chemical Engineering, P.O. Box: 5050, King Fahd University of Petroleum and Minerals, 31261 Dhahran, Saudi Arabia, e-mail: Bakatheer@kfupm.edu.sa

ABSTRACT

A vanadium (III) complex catalyst bearing a salicylaldiminato ligand of the general formula $[\text{RN}=\text{CH}(2,4\text{-}^t\text{Bu}_2\text{C}_6\text{H}_2\text{O})]\text{VCl}_2(\text{THF})_2$, where $\text{R} = 2,6\text{-}^i\text{Pr}_2\text{C}_6\text{H}_3$ was synthesized as shown in **Fig. 1**. Titanium dioxide doped with tungsten (TiO_2/W) was used to study the effect of nanofillers on the polyethylene nanocomposites properties. Using titanium dioxide doped with tungsten (TiO_2/W) was resulted in increasing the molecular weight (M_w) of polyethylene nanocomposites up to five times compared to the neat polyethylene. The optimum dosage of the TiO_2/W nanofiller was 10 mg which molecular weight (M_w) was 1.2×10^6 ($\text{g}\cdot\text{mol}^{-1}$). The catalyst activity was increased up to 60 % by using 10 mg of TiO_2/W nanofiller. Besides investigation of the molecular weight (M_w) and catalyst activity, the crystallinity and thermal characteristics of polyethylene and polyethylene nanocomposites were studied.

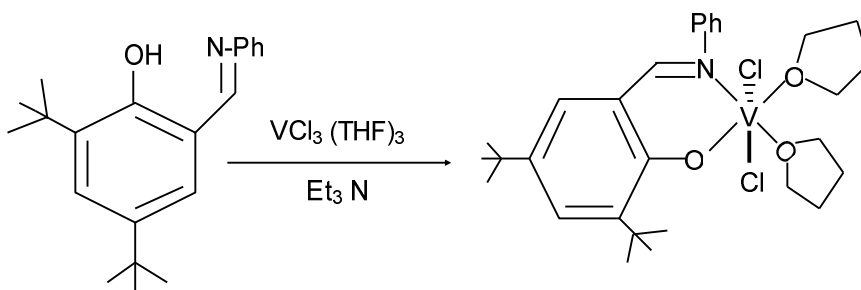


Fig. 1: Catalyst Synthesis Scheme

Acknowledgement: The authors wish to acknowledge the assistance of Deanship of Scientific Research, King Fahd University of Petroleum and Minerals for their support for providing adequate funds and infrastructure under Project no. IN101018.