Mendeleev 2019

XI International Conference on Chemistry
for Young Scientists

BOOK OF ABSTRACTS

PRODUCTION OF UHMWPE USING THE CATALYTIC SYSTEMS BASED ON TI (III/IV) TETRAHYDROFURANATES

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The processing of UHMWPE is complicated due to its high melt viscosity and is usually conducted by solution method. Another opportunity to process UHMWPE is solvent-free method developed by Smith[1,2] and modified by Rastogi[3]. In this work, we report catalytic systems based on titanium (III/IV) tetrahydrofuranates that are able to produce UHMWPE, suitable for solvent-free processing techniques.

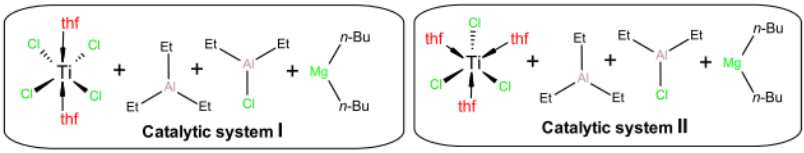

Figure 2. Two types of catalytic systems for production of UHMWPE

These systems catalyze ethylene polymerization with activities up to 1840 kg PE/mol $Ti^{-1}\cdot h^{-1}\cdot atm^{-1}$. The obtained UHMWPE reaches M_w up to $7.9\cdot10^6$ Da and has very low bulk density, less then 0,1 g/cm^3. That is one of the crucial prerequisites for solid-state formation of tapes from UHMWPE nascent powder. All UHMWPE powders with M_w higher than $2*10^6$ Da were transformed into tapes by solid-state method described by Ozerin[4]. For the resulting tapes, the highest breaking strength of 2.1 GPa has been achieved.

References
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Acknowledgements. This work was financially supported by Russian Science Foundation (Project No. 16-13-10502, Ti (IV) catalytic studies, UHMWPE processing and evaluation) and Russian Foundation for Basic Research (Project No. 17-03-00234, Ti (III) catalytic studies).