Med Chem (Los Angeles) 2018, Volume 8
DOI: 10.4172/2161-0444-C2-043

18th International Conference on

Pure and Applied Chemistry

August 31- September 01, 2018 | Toronto, Canada

Use of pyrolytic lignin in the production of rigid polyurethane foams

Thana Saffar[1,2], **Flavia Braghiroli**[1], **Sara Magdouli**[2], **Hassine Boufif**[2] and **Ahmed Koubaa**[1]
[1]University of Quebec in Abitibi-Témiscamingu, Canada
[2]High school of Abitibi-Témiscamingue, Canada

Forest biomass pyrolysis is a thermochemical conversion that leads, among others, to pyrolytic bio-oil typically used as a biofuel alternative. Eventually, waste of pyrolytic bio-oil could constitute an eco-friendly solution that could generate value-added chemicals for various applications. In this context, recent trends have focused on the production of a low-cost and efficient material through the valorization of lignin's residue. This study aimed to assess the potential of employing pyrolytic lignin in producing rigid polyurethane foams widely used in thermal insulation. It is worth mentioning that polyurethane results from the reaction of two monomers namely: Polyol and isocyanate. Hence, theoretically, lignin could play the role of a monomer as a polyol in the reaction of polymerization. For this purpose: i) First, pyrolytic lignin was extracted from bio-oil yielding 30% in weight; ii) second, a chemical modification via oxypropylation reaction was performed to work around the limited reactivity of lignin because of its hindered structure. The effect of weight ratio of pyrolytic lignin/propylene oxide, temperature and catalyst concentration ranging respectively (10/90–50/50), (150–250°C) and (5–20%), were evaluated on the hydroxyl index and thereafter optimized; (iii) finally, the 40/60 ratio (lignin/propylene oxide) substituted up to 20% of conventional polyol. The ensuing polyol was incorporated afterward in polyurethane foam formulations. Preliminary results showed that the isolated then modified pyrolytic lignin was appropriate to be a part of polyurethane's matrix with improved mechanical properties compared to its commercial homologs.

thana.saffar@uqat.ca