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LETTER TO THE EDITOR

Authors' Response to Comments on Kinetics Studies on Oxirane Cleavage of Epoxidized Soybean Oil by Methanol and Characterization of Polyols

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Recently we received a letter from Yijin Xu and Zoran S. Petrovic concerning our paper entitled, "Kinetics Studies on Oxirane Cleavage of Epoxidized Soybean Oil (ESO) by Methanol and Characterization of Polyols", published in The Journal of American Oil Chemists' Society (2008) 85:113–117 (doi:10.1007/s11746-007-1187-5). After receiving the comments, we rechecked our work and now respond to these comments.

1. The basic properties of the ESO used in the original paper were checked and found to have an acid value of 1.02 mg KOH/g, hydroxyl number (OH#) of 8.56 mg KOH/g, and an iodine value (IV) of 1.62. The acid value for the ESO we used is higher than that used by Xu and Petrovic (0.12 mg KOH/g) while the hydroxyl number and IV are similar. After neutralization and washing, the acid value of our ESO was 0.18 mg KOH/g.
2. The IR spectra of neutralized and washed ESO showed that the smaller peak at 3,500 cm^{-1} of the untreated ESO was removed. This result suggests the extraneous signal was not related to the ESO molecule as hydroxyl groups but probably resulted from an impurity present in the original ESO utilized in the published study. This finding is also consistent with the lower hydroxyl number after neutralization and washing.
3. "Page 113, right column, line 7 from bottom: The preparation of polyols from ESO with various reactants has been the subject of many studies [8, 9]. Reference 8 cited in this paper has nothing to do with fatty-based polyols." Reference 8 and 9 should be 7 and 9.
4. "Page 114, left column, line 2: Other advantages of polyurethanes synthesized from soy-based polyols include a higher thermal stability and improved dielectric properties [1, 7]. Reference 7 is about polyols and does not have any relevance to thermal stability and dielectric properties of polyurethanes." Reference 1 and 7 should be 1 and 6.
5. "Hydrogen peroxide 30% and sulfuric acid 98% were listed in the materials section but nowhere in the paper were they used. They are usually chemicals used in epoxidation but the authors have used a commercially obtained ESO." Hydrogen peroxide 30% and sulfuric acid 98% should be deleted.
6. In the methods section of the published paper, we stated, "ESO (40.0 g, 0.154 mol) was charged into a four-necked round-bottomed reaction flask equipped with a reflux condenser and was heated to the desired temperature in a constant-temperature water bath". The 0.154 moles referred to moles of epoxy rings in the triglyceride. For the reaction run at 70 °C, ESO was preheated to about 76 °C while the methanol was separately preheated almost to its boiling point of 64 °C. The methanol was quickly transferred to the ESO reaction flask, and the flask immediately place in a water bath heated to 70 °C. After the desired reaction time, the sample was washed and concentrated by a rotary evaporator under high vacuum at 70 °C. This product was analyzed for epoxy oxygen content and hydroxyl number.
7. When repeating the published ring opening experiments between the purified ESO and methanol at 65 °C for 2 h without catalyst, we found that the reaction does not proceed. From this finding we conclude, in

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agreement with Petrovic and Xu, that the ESO used in our published results contained an acidic impurity that catalyzed the ring opening of the ESO by methanol.

We agree with the comments and conclusions put forth by Yijin Xu and Zoran S. Petrovic. We appreciate the time they invested and their efforts they made. Since the new results essentially invalidate the original kinetic results, we would like to retract our paper entitled "Kinetics Studies on Oxirane Cleavage of ESO by Methanol and Characterization of Polyols" that was published in the Journal of American Oil Chemists' Society (2008) 85:113–117 (doi:10.1007/s11746-007-1187-5).