

# Preparation and characterization of soybean oil-based waterborne polyurethane/acrylate hybrid emulsions for self-matting coatings

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Table S1 General Properties of MESO

Polyol	OH number (mg KOH/g)	Acid number (mg KOH/g)	Iodine value (g/100 g)	Hydroxyl functionality	Equiv weight (g/equiv)	Mw
MESO	129	0.5	6	2.4	434	1030

Table S2 Chemical composition

polyol	Molar ratio			Residual
	OH <sup>1</sup> (MESO)	NCO (IPDI)	OH <sup>2</sup> (DMPA)	NCO (%)
MESO	1.0	1.2	0.56	6.54

The hydroxyl value of polyols were determined by Acetic Anhydride Acetylation.

Measurement process

1. Prepare 0.5 N KOH solution;
2. Prepare acetylation reagent: 80 mL of ethyl acetate, 1 g of p-toluenesulfonic acid, and 9 mL of acetic anhydride were mixed in a brown erlenmeyer flask;
3. Prepare pyridine aqueous solution: pyridine and water were mixed with the ratio of 2:1 in a brown erlenmeyer flask.
4. 10 mL acetylation reagent and W g were mixed in the iodine flask, and the reaction kept at 65 °C for 30 min. Then, the reaction mixture was cooled to room temperature, subsequently, 20 mL pyridine aqueous solution was added to the iodine flask. Add 0.1 mL of the phenolphthalein indicator solution and titrate immediately with the 0.5 N KOH solution to a pink end point that persists for at least 15 s.

Calculate the hydroxyl number, mg KOH/g, of sample as follows:

$$\text{Hydroxyl number} = [(A-B)N \times 56.1]/W$$

where:

A = KOH required for titration of the blank, mL,

B = KOH required for titration of the sample, mL,

N = normality of the KOH, and

W = sample used, g.