

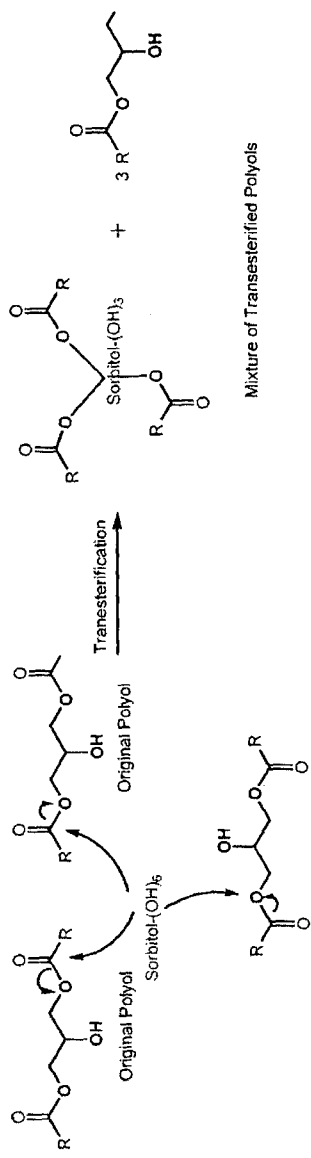


Figure 1

Overall Master Batch Method

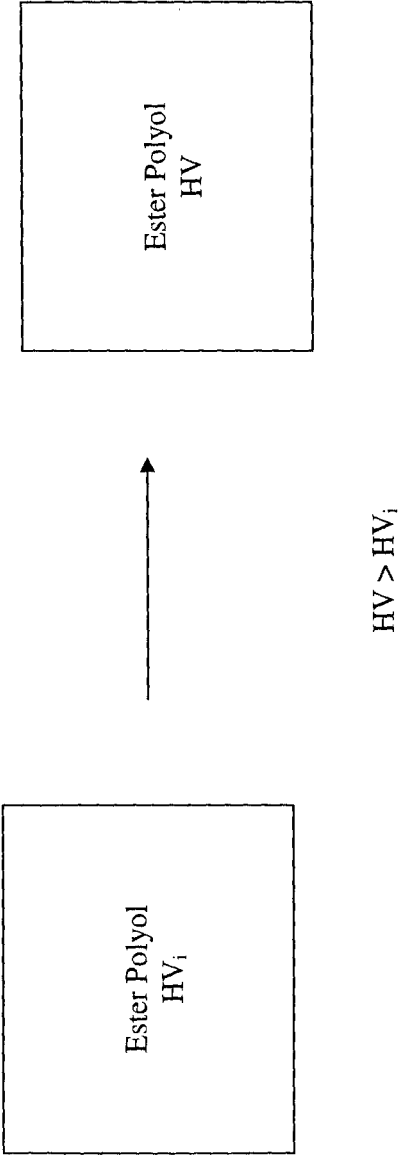


Figure 2

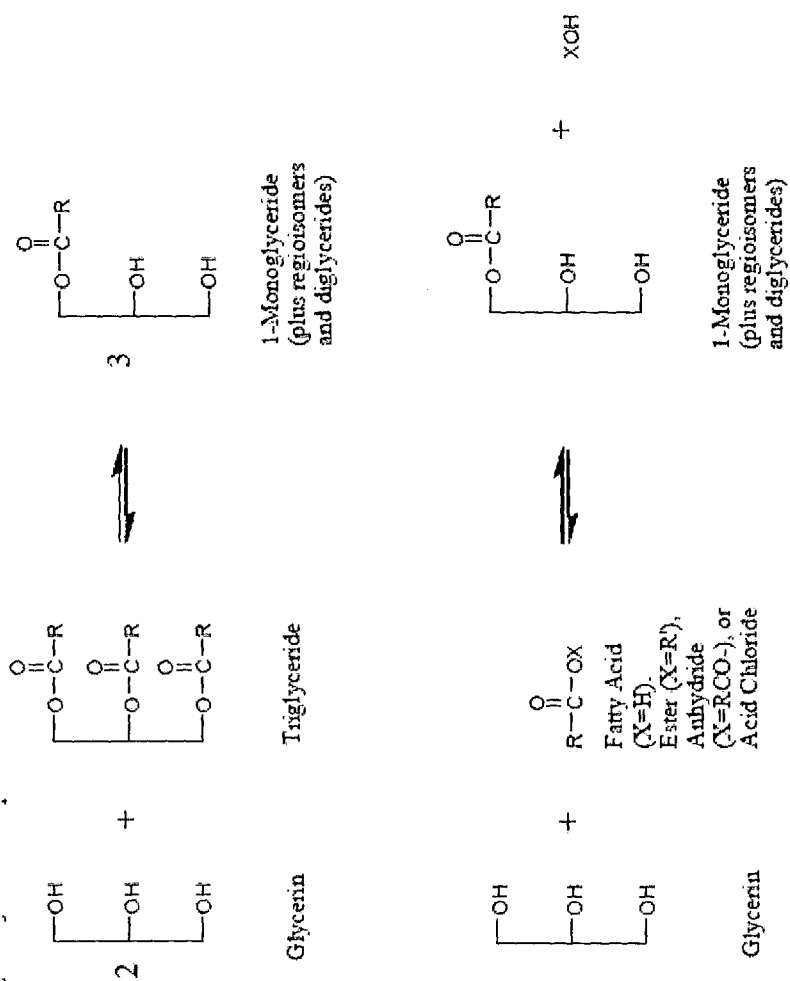
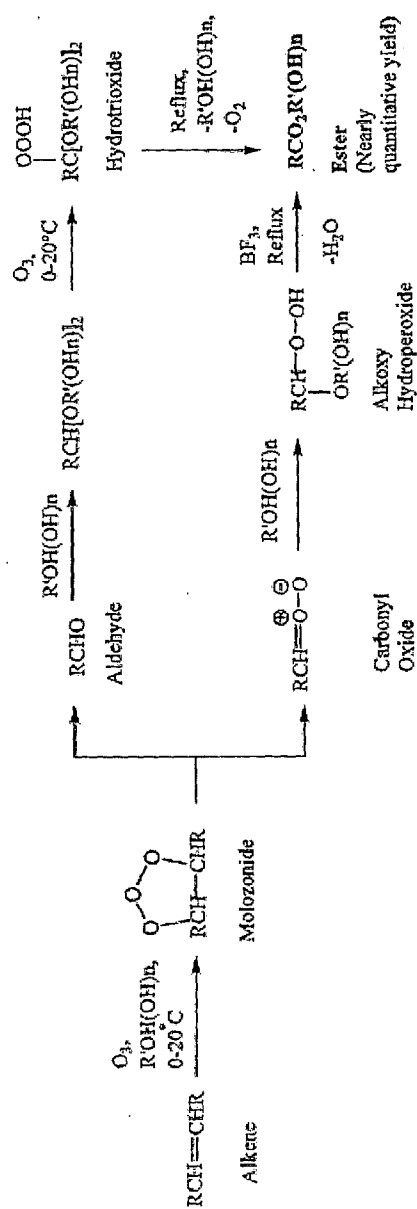


Figure 3: The pre-esterification of glycerin

Method 1



Notes: BF_3 is typically used as catalyst in the reaction of the Aldehyde with $\text{R}'\text{OH}(\text{OH})_n$ in the upper pathway.

The final product is typically an ester polyol, $\text{RCO}_2\text{R}'(\text{OH})_n$.

Figure 4

Method 2

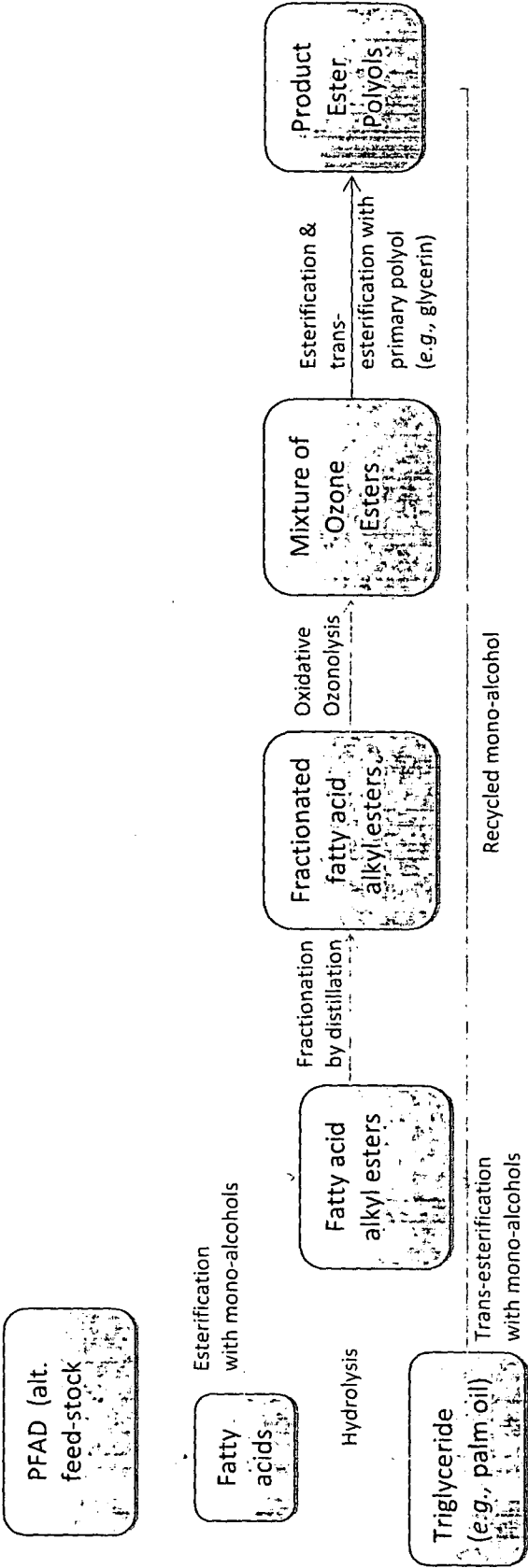


Figure 5

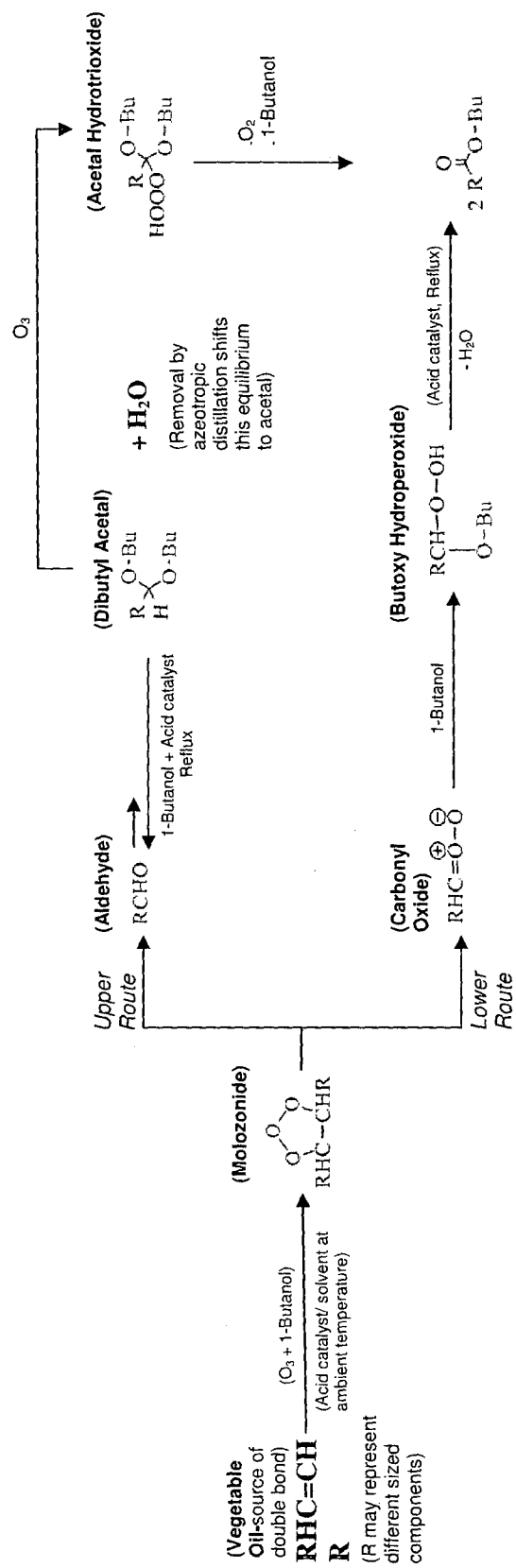
Method 3

Figure 6