Supplementary material for the article:

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Supplementary material

Choline chloride-based deep eutectic solvents in CaO-catalyzed ethanolysis of expired sunflower oil

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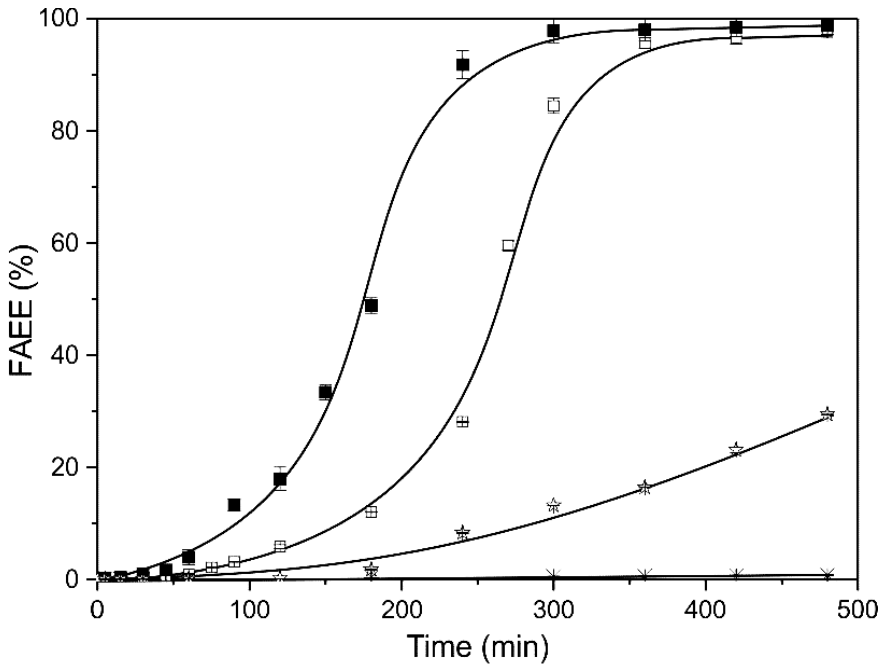

Fig. S.1 The variations of the FAEE content with the progress of expired sunflower oils ethanolysis catalyzed by non-calcined CaO (□), calcined CaO (■), $Ca(OH)_2$ (✯) and $CaCO_3$ (✳).

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Abbreviations: ChCl:DMU - choline chloride:1,3-dimethylurea; ChCl:EG - choline chloride:ethylene glycol; ChCl:G - choline chloride:glycerol; ChCl:PG - choline chloride:propylene glycol; ChCl:TU - choline chloride:thiourea, ChCl:U - choline chloride:urea; DES - deep eutectic solvent; FAEE - fatty acid ethyl ester.

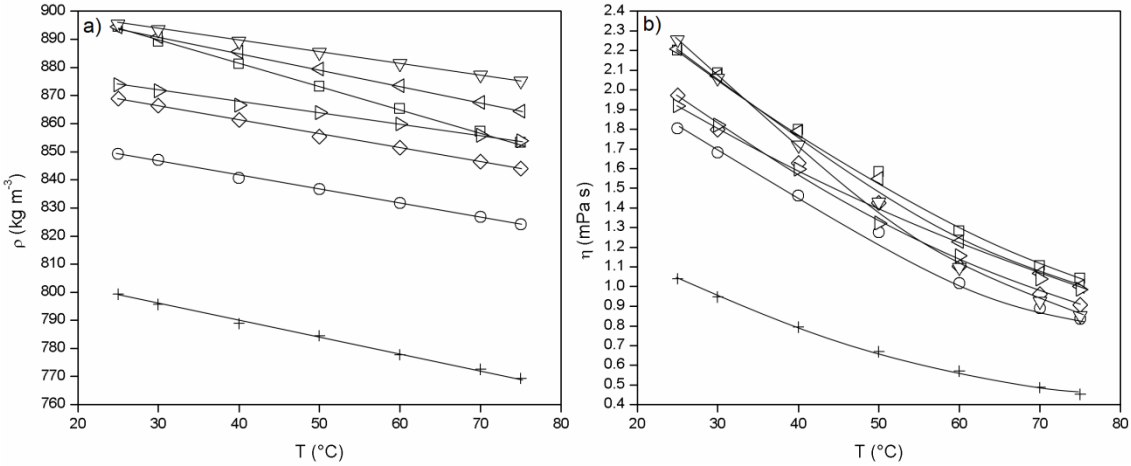

Fig. S.2 Temperature dependence of the density (**a**) and the viscosity (**b**) of ethanol (+) and ethanol mixed with the studied DESs: ChCl:EG (○), ChCl:PG (◇), ChCl:G (□), ChCl:U (◁), ChCl:DMU (▷) and ChCl:TU (▽).

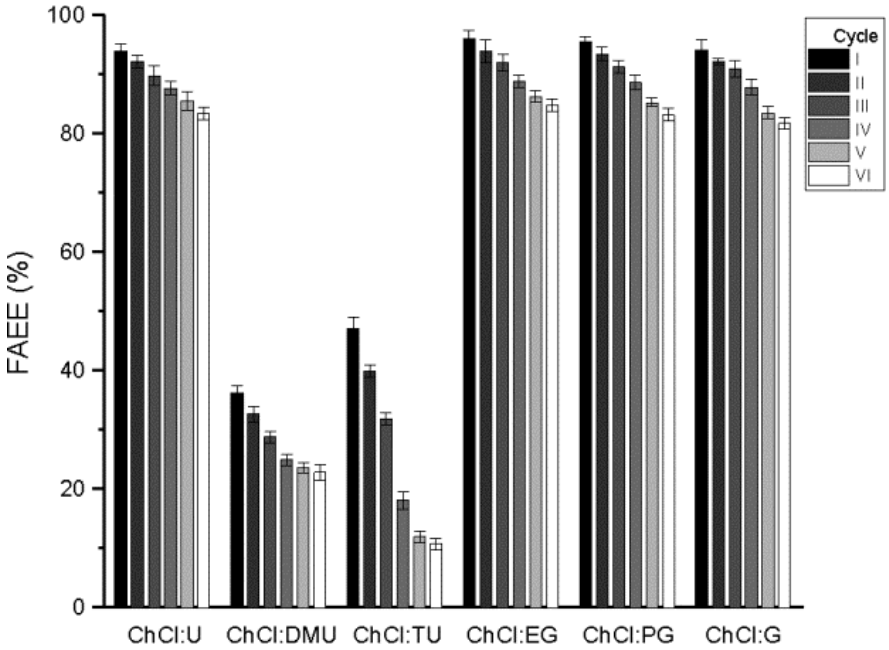

Fig. S.3 Reusability of non-calcined CaO catalyst activated by different DESs. CaO activated with a DES was used in the first batch, while only the recovered CaO was used in the other batches.

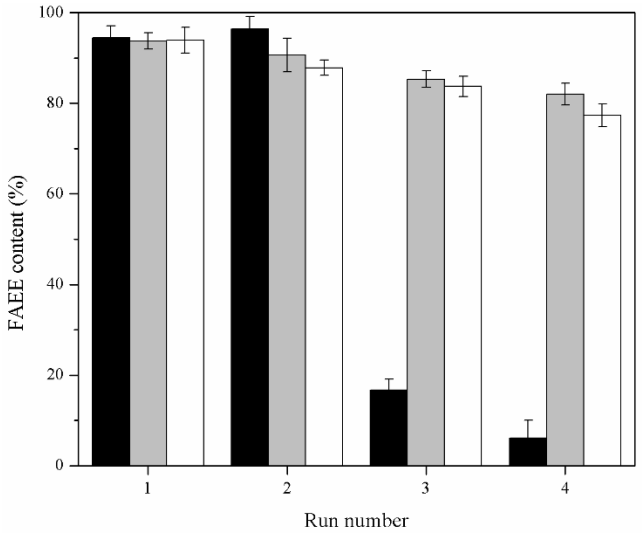

Fig. S.4 The FAEE content after 2 h reaction in four consecutive batches of the sunflower oil ethanolysis catalyzed by either fresh or recovered CaO catalysts in the presence of the recovered ChCl:G DES as a cosolvent (70 °C and the ethanol-to-oil molar ratio was 12:1; reaction systems: recovered ChCl:G DES/glycerol product and recovered CaO - black rectangles, recovered ChCl:G DES/glycerol product and fesh CaO - white rectangles, and treated recovered ChCl:G DES/glycerol product was coupled with fresh CaO - gray rectangles)