# Supplementary Information

## An innovative, low cost and environment friendly approach for deep eutectic solvent as the water substitute to avoiding the waste effluent in the textile industry with the better clothing-related performance

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## Methods

The decomposition condition of deep eutectic solvent was evaluated using thermogravimetric analysis (TGA, Q500, TA Instruments). Samples (about 20 mg) were heated from 30 to 500 °C with a heating rate of 10 °C/min under nitrogen atmosphere. The onset decomposition temperatures ($T_{onset}$) were calculated as the extrapolated onset of the thermogravimetric curves.

The thermally stability of deep eutectic solvent during dyeing process was evaluated using thermogravimetric analysis (TGA, Q500, TA Instruments). Samples (about 20 mg) were heated at 100 °C with a duration of 150 min (9000 s) under nitrogen atmosphere.

## Results and discussion

Fig S1 represented TGA curves of deep eutectic solvent. Table S1 summarized the values of the onset decomposition temperature ($T_{onset}$). The onset decomposition temperature is a remarkable property as it determines the maximum temperature at which deep eutectic solvent can maintain their liquid state without decomposition and thus their range of use as solvents[1-3]. The onset decomposition temperature by our test was similar with previous reports and indicated that deep eutectic solvent can not be decomposed during the comparatively high temperature[4, 5].

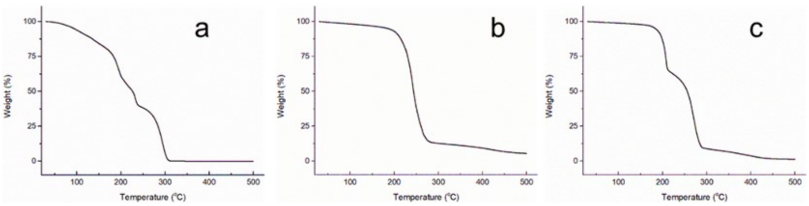


Fig S1. TGA curves for (a) choline chloride-oxalic acid, (b) choline chloride-malic acid, and (c) choline chloride-citric acid.

Table S1. Decomposition temperature of deep eutectic solvent samples

| | choline chloride-oxalic acid | choline chloride-malic acid | choline chloride-citric acid |
|---|---|---|---|
| $T_{onset}$ (°C) | 157.5 | 206 | 156.0 |

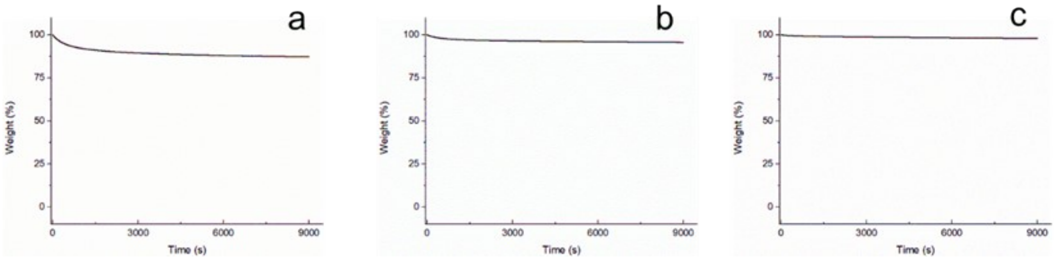


Fig S2. Isothermal TGA curves for (a) choline chloride-oxalic acid, (b) choline chloride-malic acid, and (c) choline chloride-citric acid.

TGA curves of deep eutectic solvent were shown in Fig S2. In this work, the dyeing temperature (not more than 100 $^{o}C$) was lower than the decomposition temperature of the deep eutectic solvent and the low weight loss rate of used solvent during the dyeing time (not more than 120 min) from TG curves, which indicated that used solvent had good thermally stability during this process[1, 6].

Reference

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