

Supplementary Information

Inhibiting degradation of cellulose dissolved in ionic liquids via amino acids

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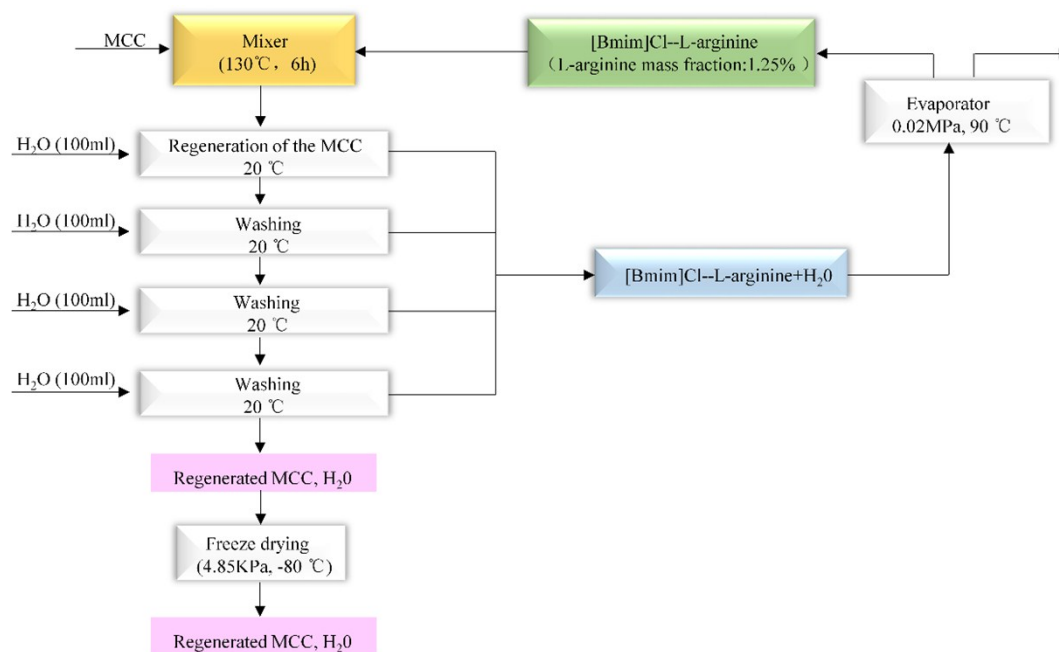


Fig.S1 [Bmim]Cl—L-arginine recycling procedure

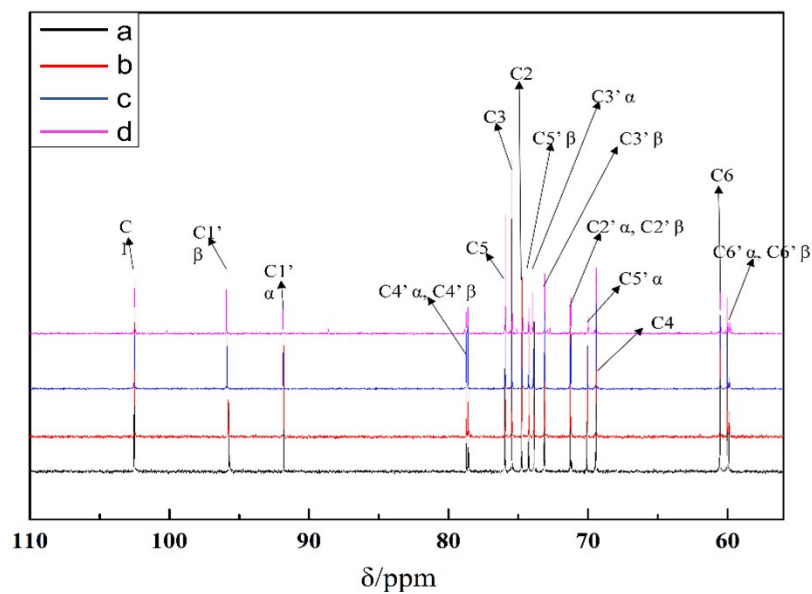
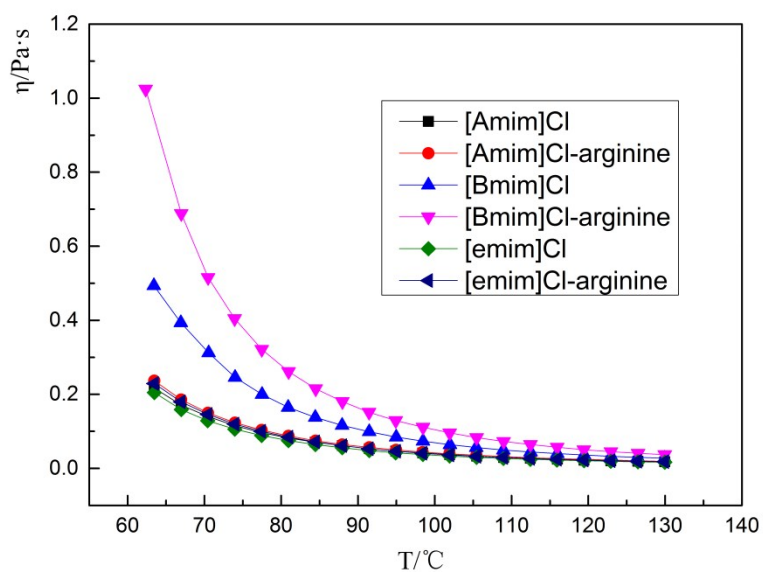
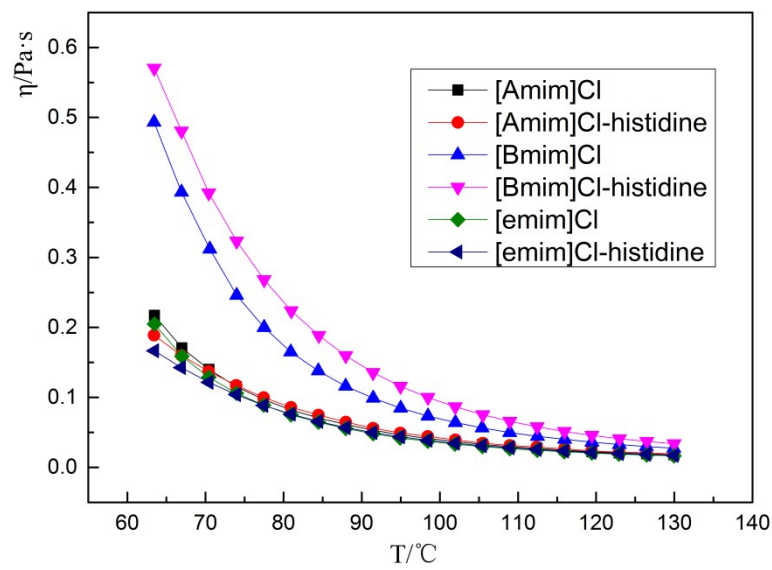
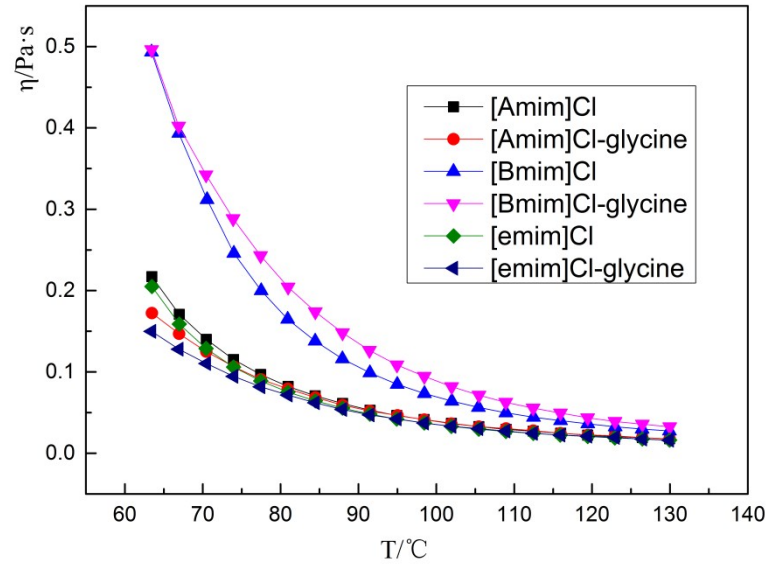
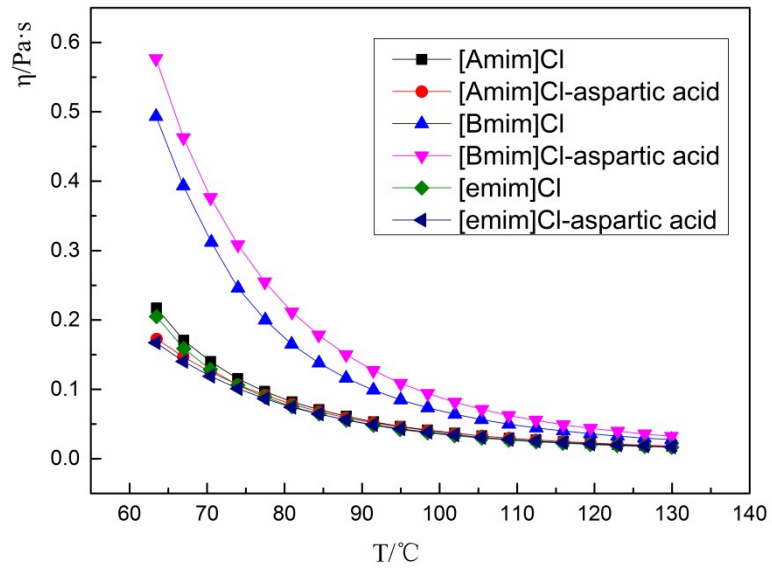
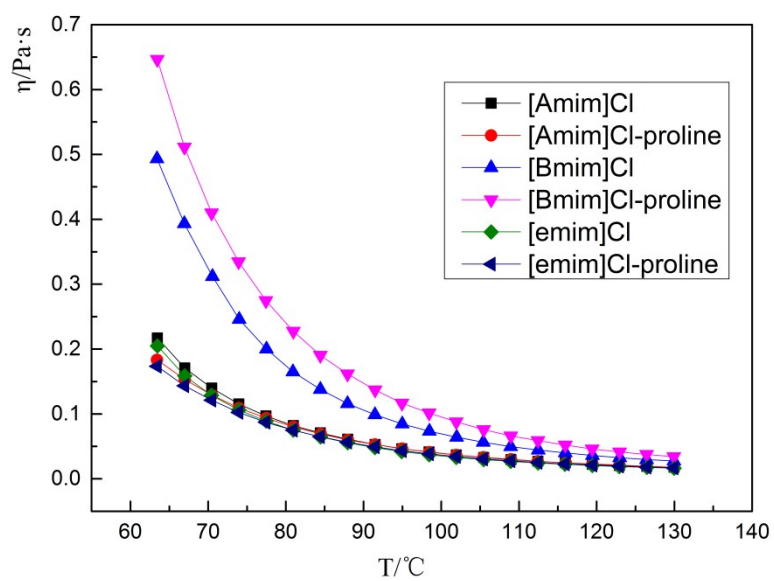
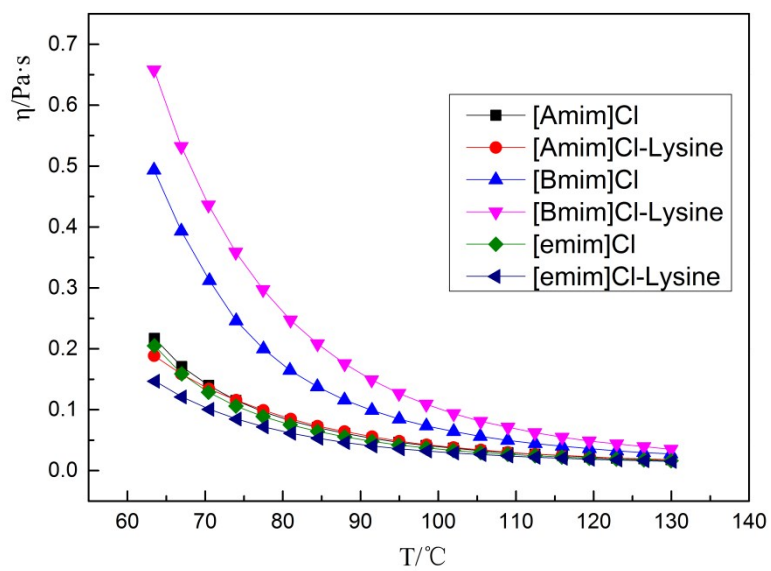
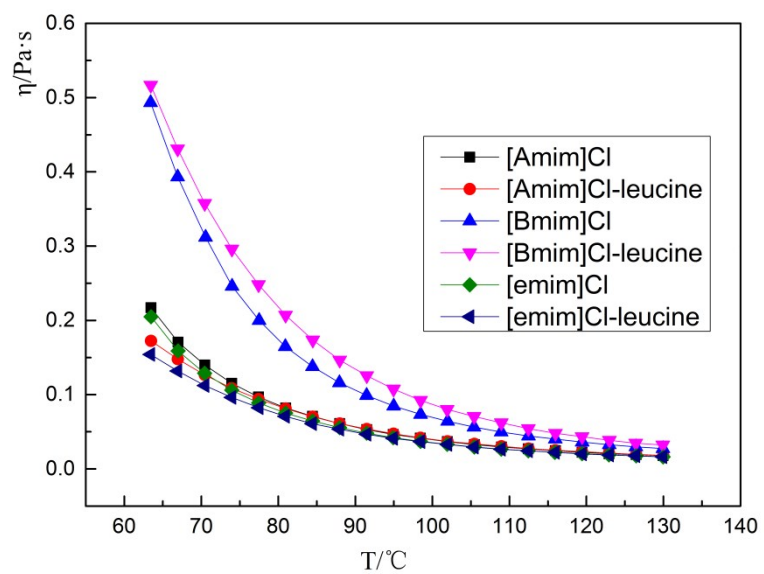
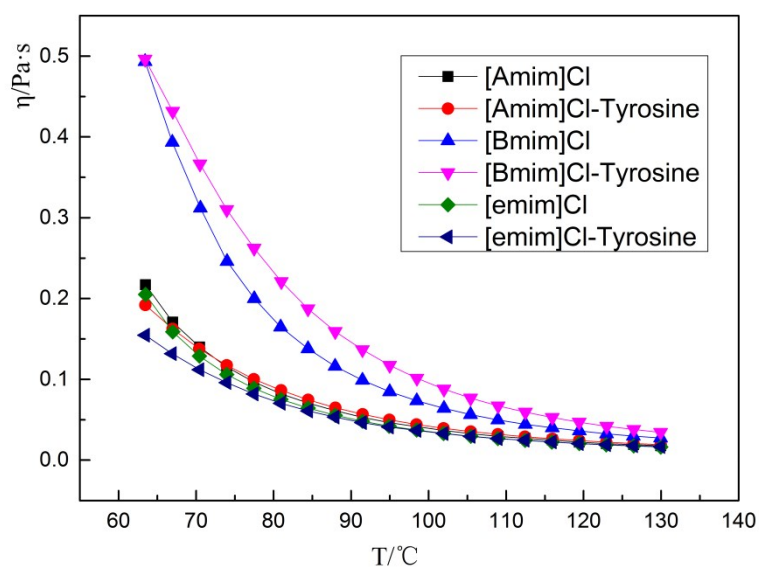
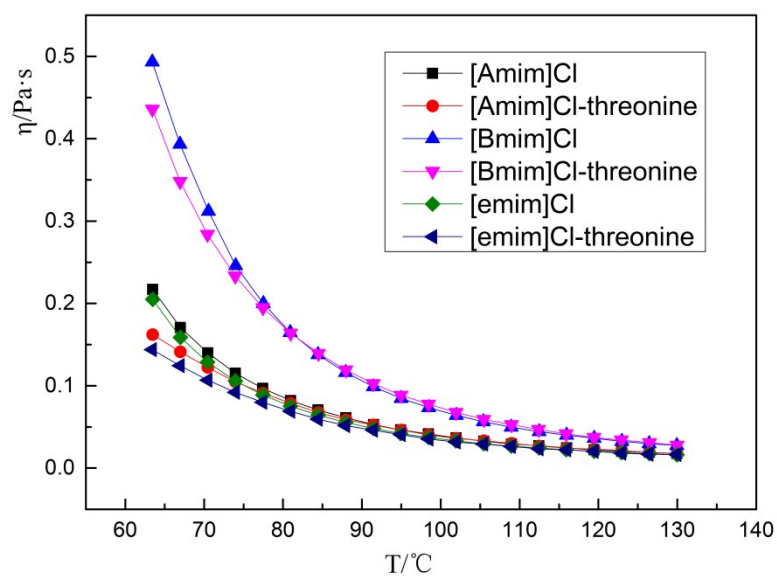
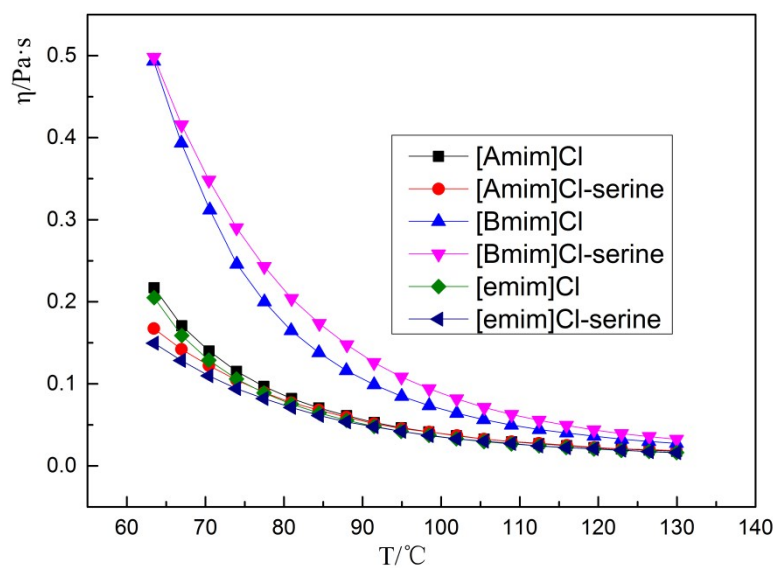


Fig.S2 ^{13}C NMR carbon spectrum of cellobiose. Pure cellobiose a), cellobiose: L-arginine=1:0.33 b), cellobiose: L- arginine=1:1.14 c), cellobiose: L- arginine=1: 2.28 d)









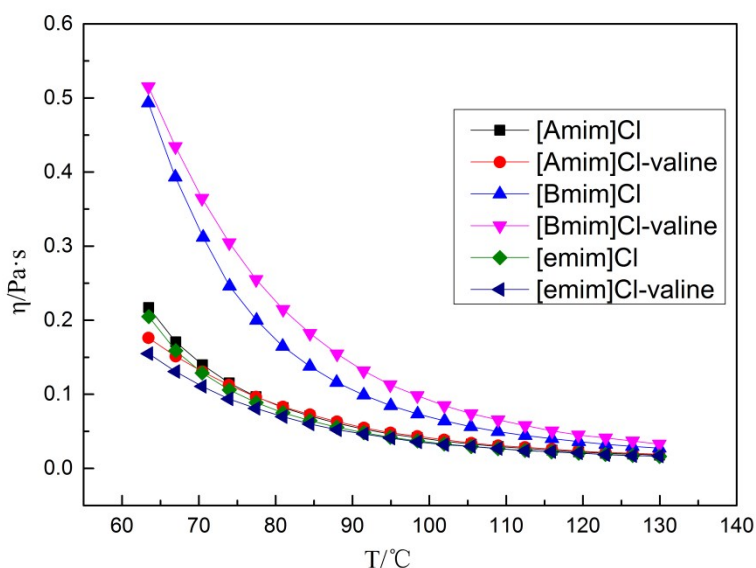


Fig. S3 Viscosity of different ionic liquid-amino acids systems

The ionic liquid solution of different amino acids was prepared according to the molar ratio of 1.25:100.

For [Amim]Cl, the viscosity of the binary system after adding threonine, valine, tyrosine, serine, proline, lysine, leucine, histidine, glycine and aspartic acid is firstly less than and then more than that of pure [Amim]Cl with the temperature increasing from 60°C to 130°C. As the temperature increases from 60°C to 130°C, the viscosity after adding L-arginine is more than that of pure [Amim]Cl throughout.

For [Bmim]Cl, the viscosity of the binary system after adding valine, tyrosine, serine, proline, lysine, leucine, histidine, glycine, aspartic acid and arginine is more than that of pure [Bmim]Cl throughout with the temperature increasing from 60°C to 130°C. The viscosity of the binary system after adding threonine is firstly less than and then more than that of pure [Bmim]Cl as the temperature increases from 60°C to 130°C.

For [Emim]Cl, the viscosity of the binary system after adding valine, tyrosine, serine, proline, glycine, leucine, histidine and aspartic acid is firstly less than and then more than that of pure [Emim]Cl with increasing temperature from 60°C to 130°C. As the temperature increases from 60°C to 130°C, the viscosity after adding threonine and lysine is less than that of pure [Emim]Cl throughout. As the temperature increases from 60°C to 130°C, the viscosity after adding L-arginine is more than that of pure [Emim]Cl throughout.

In summary, the effect of amino acids on the viscosity of ionic liquids is related to both

the type and structure of additives, the structure of ionic liquids and the temperature.

Table S1 Amino acid classification

Amino acid category	Amino acid
non-polar amino acids	Valine, Leucine, Proline,
polar uncharged amino acids	Glycine, Serine, Threonine, Tyrosine
positively charged amino acids	Lysine, arginine, histidine
negatively charged amino acids	Aspartic acid

Table S2 Amino acid classification

Amino acid category	Amino acid
Aliphatic amino acid	valine, leucine, aspartic acid, lysine, arginine, glycine, serine, threonine,
Aromatic amino acid	tyrosine
Heterocyclic amino acid	Histidine
Heterocyclic amino acid	Proline

According to the polarity and R group, amino acids can be divided into the following types as shown in Table S1 and S2 .The 11 kinds of amino acids selected contain all of the above types.