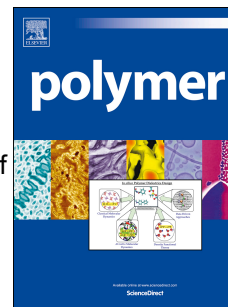


# Accepted Manuscript

Thermodynamic phase analysis of acrylic polymer/hindered phenol hybrids: Effects of hydrogen bonding strength

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## Graphical Abstract

# Thermodynamic Phase Analysis of Acrylic Polymer/Hindered Phenol Hybrids: Effects of Hydrogen Bonding Strength

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The upper critical solution temperature-type thermodynamic phase diagrams of acrylic polymer/hindered phenols damping materials were drawn to investigate its' long-term stability. We report that increasing the intermolecular hydrogen bonding strength between the hindered phenol and carbonyl groups of PBMA could effectively reduce the Flory-Huggins interaction parameter  $\chi$ . Meanwhile, increasing the steric hindrance of the phenolic hydroxyl groups and the sizes of small molecules may sufficiently weaken intramolecular hydrogen bonding interactions. These effects suppress the self-aggregation of small molecules and improve the long-term stability. The phase diagrams are essential not only for the structural optimization of small molecules, but also for determining the composition ratio of these novel damping materials.

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