

Formulation of the plastic-free 3D printing emulsion ink using naturally occurring bee pollen microparticles

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3D printing inks that are extrudable under ambient conditions are gaining increasing attention because of the easy processability and eco-friendliness. Herein, we developed an oil-in-water emulsion-type 3D printing ink stabilized by naturally occurring bee pollen microparticles as an eco-friendly amphiphilic Pickering emulsifier. The developed ink has the satisfactory viscoelasticity and shape retention ability, allowing the facile additive manufacturing of 3D architectures via the extrusion under ambient conditions. Furthermore, the extrusion product has the controllable macroporosity via the removal of internal oil phases at various volume fractions, which can be useful for the manufacturing of light-weight materials.