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# Colloidal Lattices of Environmentally Responsive Microgel Particles at Ionic Liquid–Water Interfaces

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**ABSTRACT:** This work reports new evidence of the versatility of soft and environmentally responsive micron-sized colloidal gel particles as stabilizers at ionic liquid-water droplet interfaces. These particles display a duality with properties ascribed typically to both polymeric and colloidal systems. The utilization of fluorescently labeled composite microgel particles allows in-situ and facile visualization without the necessity of invasive sample preparation. When the prepared particles form monolayers equilibrated at the ionic liquid-water interface on fully covered droplets, the colloidal lattice re-orders itself depending on the surface charge of these particles. Finally, we demonstrate that the spontaneously formed and densely packed layer of microgel particles can be employed for extraction applications, as the interface remains permeable to small active species.

**Key Words:** microgel, colloidal lattice, ionic liquid, environmentally responsive

## 1. INTRODUCTION

In recent years, ionic liquids (ILs) have drawn significant amount of attention as tunable “green solvents” used in the interdisciplinary fields of biotechnology and chemistry due to their high thermal stability,<sup>1-3</sup> non-flammability,<sup>4-6</sup> extensive electrochemical window<sup>7,8</sup> and negligible

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