

Development of porous biomaterials via phase separation methods  
相分離法を用いた多孔質生物材料の開発

【Keywords】

Biomaterials	Porous materials	Phase separation	Membrane	Adsorbent
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■ Summary

Studies on the porous biomaterials developed in our laboratory will be introduced. Porous structures of the materials are formed by using phase separation phenomena of polymer solutions (Fig. 1). Biodegradable and bioabsorbable polymers (poly(lactic acid), etc.), polysaccharides (chitosan, etc.), and synthetic polymers (poly(methyl methacrylate)) are used as polymers. Currently, separation membranes, adsorbents, and scaffold materials have been successfully developed.

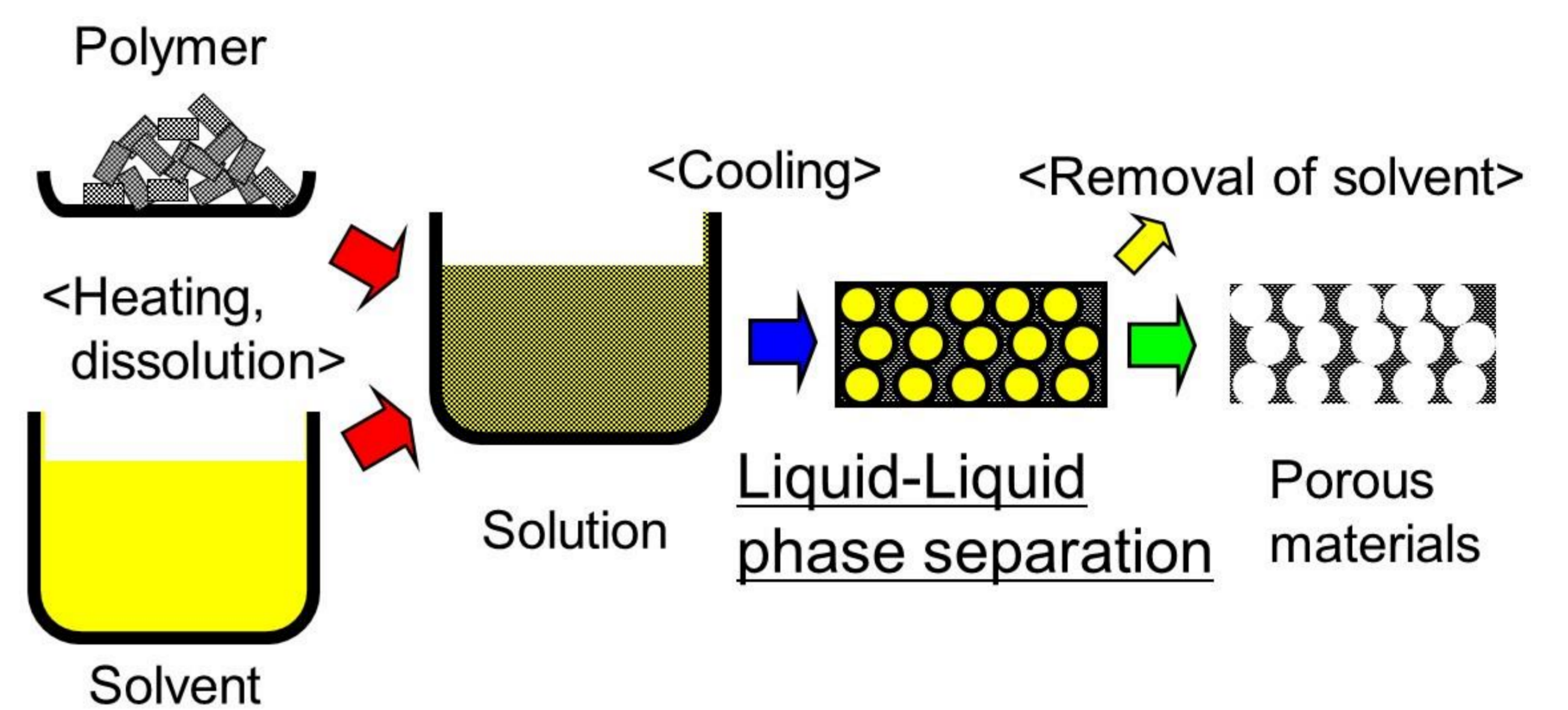


Fig. 1 Thermally induced phase separation

■ Subject Details/Topic

Microfiltration membranes of poly(lactic acid) were developed to reduce the industrial wastes after filtrations in bio and food industries. The clogged particles and fouled membranes can be degraded by composting (Fig. 2). Porous composite materials of quaternary ammonium chitosan derivatives and diatom earth adsorbed acidic proteins, such as serum albumins (Fig. 3). Hydroxyapatite particles integrated in porous materials of poly(methyl methacrylate) can adsorb various proteins. Porous materials of bioabsorbable polymers are being developed for scaffolds in tissue engineering.

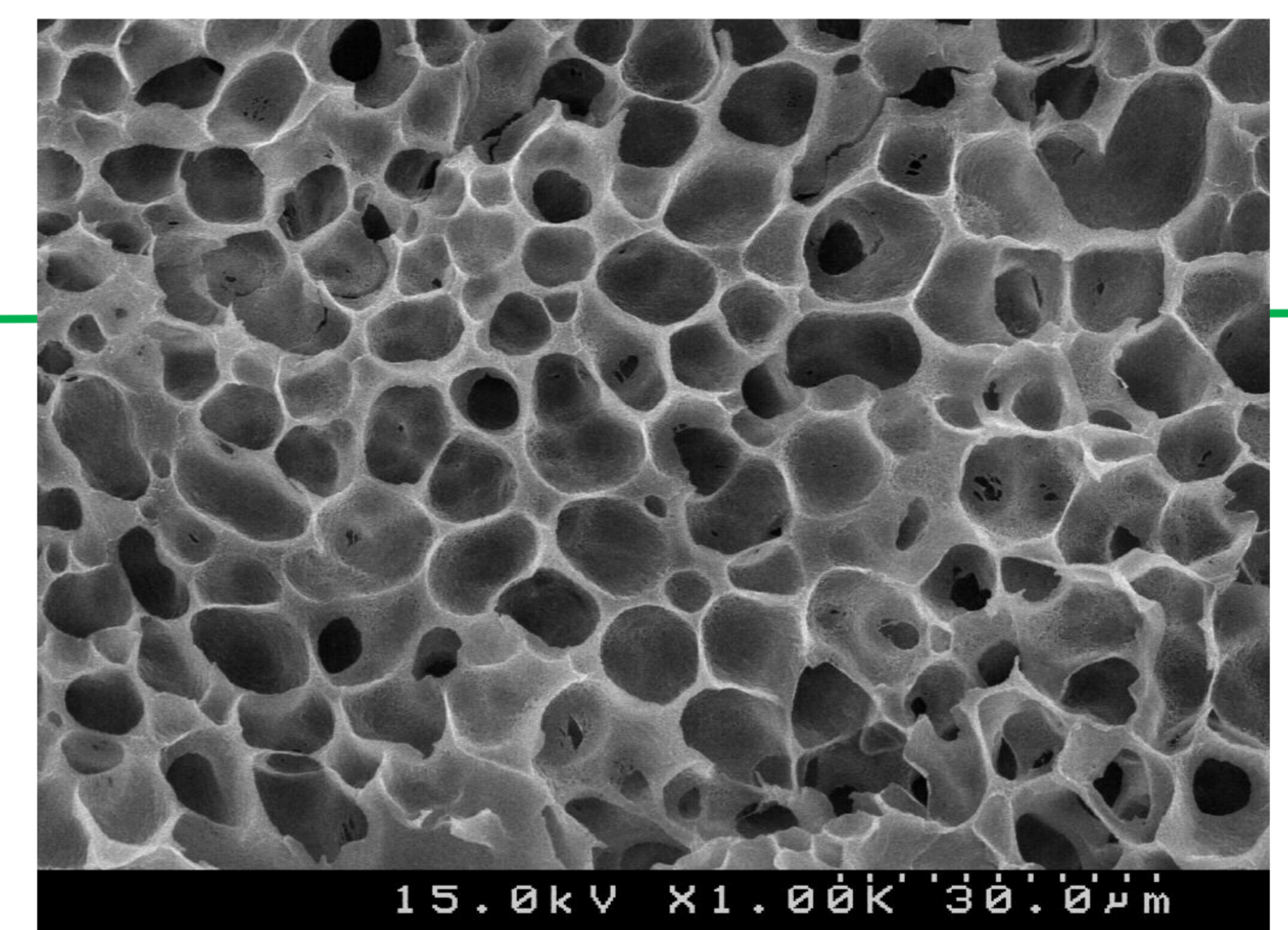


Fig. 2 Cross section of biodegradable porous membrane

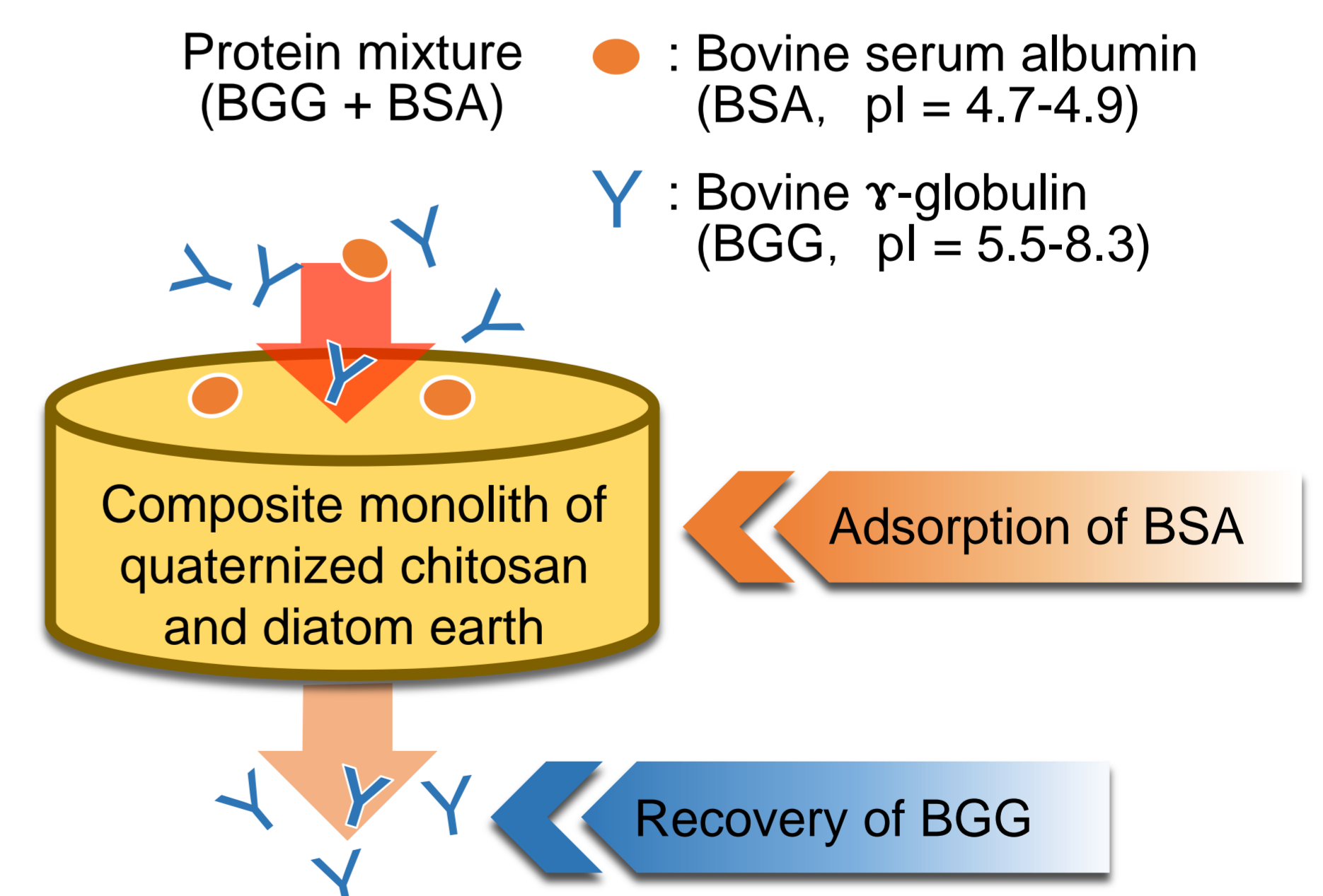


Fig. 3 Selective adsorption of protein with chitosan derivative porous monolith

■ We hope to collaborate with...

Materials companies and researchers interested in porous biomaterials.

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