

Supporting Information belonging to

Solvent-Responsive HEA-Gels as Intrinsic Actuators for Smart Reactor Concepts

Jonah Hasse, Johannes Gmeiner, Gerrit A. Luinstra

Institute of Technical and Macromolecular Chemistry, University of Hamburg, Bundesstraße 45,
20146 Hamburg, Germany

E-Mail: luinstra@chemie.uni-hamburg.de (G.A.L.)

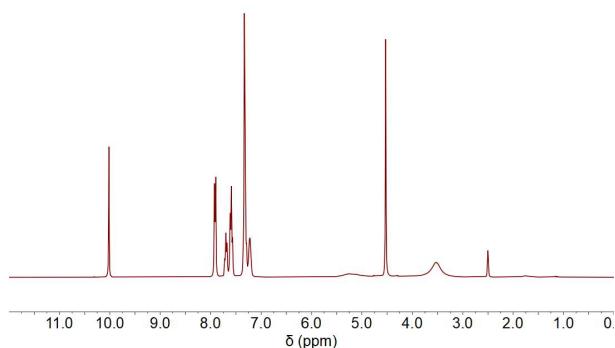


Figure S1. Representative ^1H -NMR-spectra of the reaction mixture for the aerobic oxidation of benzyl alcohol to benzaldehyde in DMSO-d_6 . The molar conversion was quantified by integrating the benzylic methylene protons of benzyl alcohol and calculating the ratio relative to the aldehyde proton of benzaldehyde. $\delta = 10.0$ (s, 1H, -CHO, benzaldehyde), 7.9 (d, $J = 7.2$ Hz, 2H, Ar-H,

benzaldehyde), 7.7 (t, J = 7.2 Hz, 1H, Ar-H, benzaldehyde), 7.6 (t, J = 7.3 Hz, 2H, Ar-H, benzaldehyde), 7.3 (d, J = 4.4 Hz, 4H, Ar-H, benzyl alcohol), 7.3 – 7.2 (m, 1H, Ar-H, benzyl alcohol), 4.5 (s, 2H, -CH₂-, benzyl alcohol).

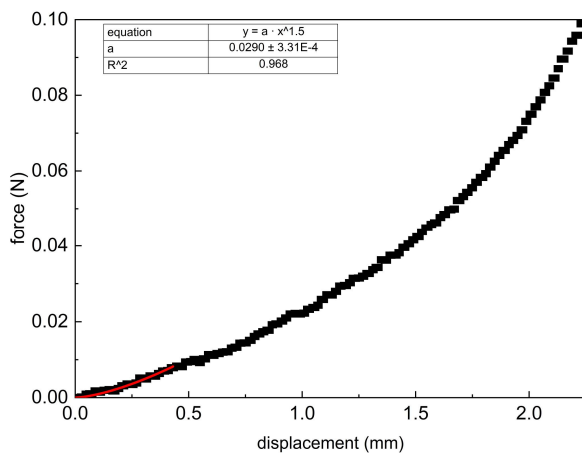


Figure S2. Force-displacement curve obtained from unconfined compression testing of HEA-20.

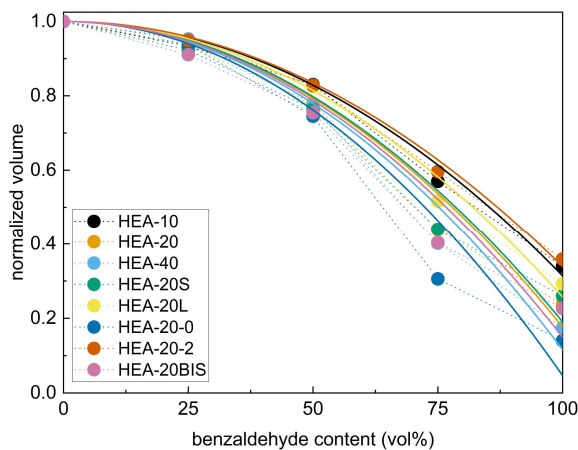


Figure S3. Relative bead volume as a function of the solvent composition. The experimental data are fitted to a quadratic model $y = 1 - C \cdot x^2$, with x as the fraction of benzaldehyde

Table S1. Fit parameters C and coefficients of determination R^2 for the solvent-dependent relative degree of swelling.

organogel	fit parameter C (10^{-5})	R^2
HEA-10	6.86	0.990
HEA-20-0	9.53	0.942
HEA-20	8.23	0.969
HEA-40	8.84	0.973
HEA-20-2	6.61	0.995
HEA-20S	8.09	0.956
HEA-20L	7.43	0.984
HEA-20BIS	8.50	0.950

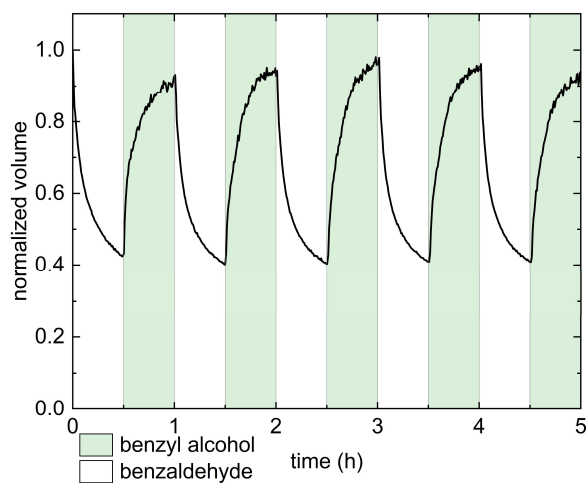


Figure S4. Cyclic exposure (30 min) of HEA-10 to benzyl alcohol (green underlay) and benzaldehyde.

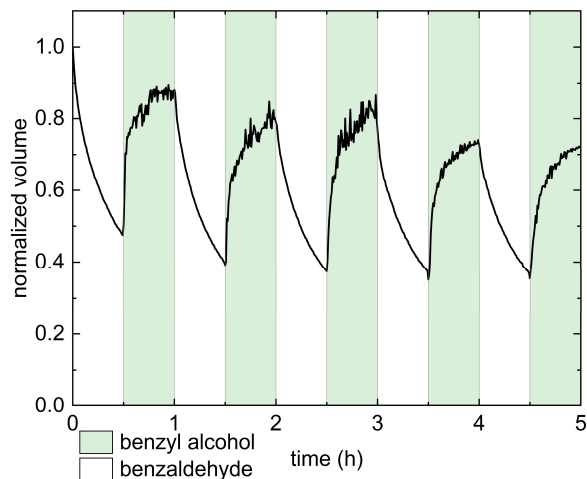


Figure S5. Cyclic exposure (30 min) of HEA-40 to benzyl alcohol (green underlay) and benzaldehyde.

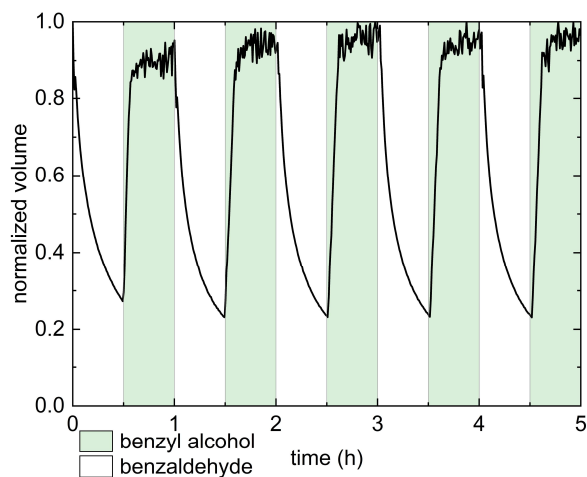


Figure S6. Cyclic exposure (30 min) of HEA-20-0 to benzyl alcohol (green underlay) and benzaldehyde.

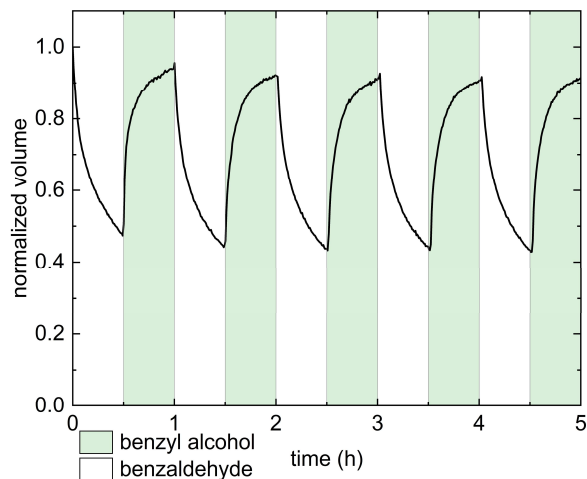


Figure S7. Cyclic exposure (30 min) of HEA-20-2 to benzyl alcohol (green underlay) and benzaldehyde.

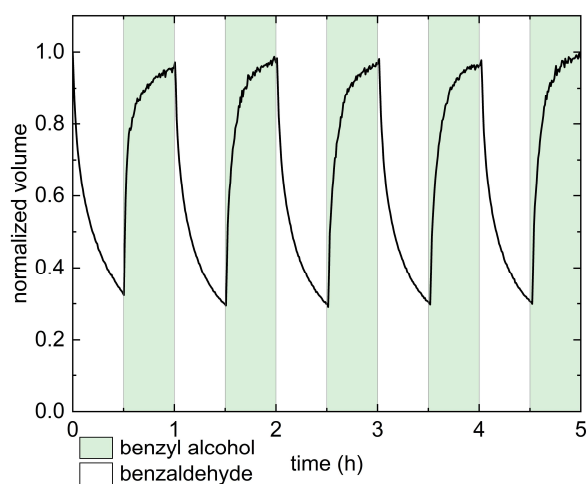


Figure S8. Cyclic exposure (30 min) of HEA-20BIS to benzyl alcohol (green underlay) and benzaldehyde.

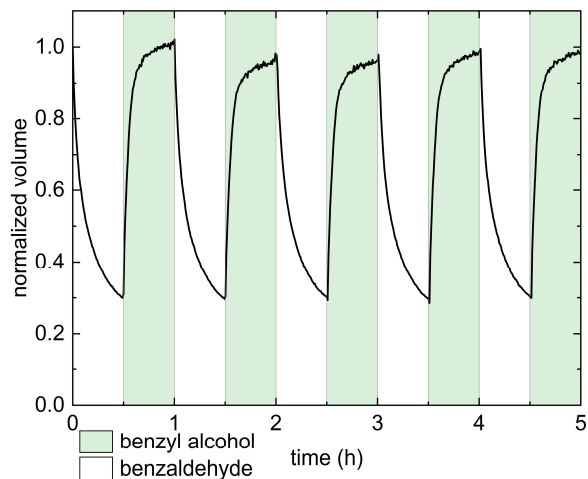


Figure S9. Cyclic exposure (30 min) of HEA-20S to benzyl alcohol (green underlay) and benzaldehyde.

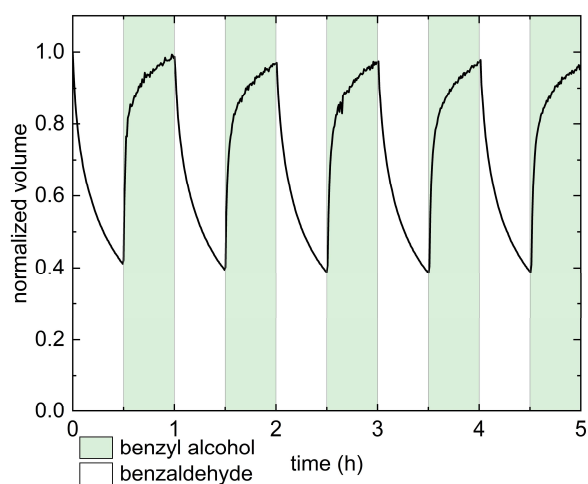


Figure S10. Cyclic exposure (30 min) of HEA-20L to benzyl alcohol (green underlay) and benzaldehyde.