

## Supporting Information

### Electron-beam derived polymeric cryogels†

Senta Reichelt\*, Christian Abe, Stefan Hainich, Wolfgang Knolle, Ulrich Decker, Andrea Prager, Robert Konieczny

<sup>†</sup>Leibniz Institute of Surface Modification, Permoserstr. 15, 04318 Leipzig, Germany,  
\*corresponding author: senta.reichelt@iom-leipzig.de

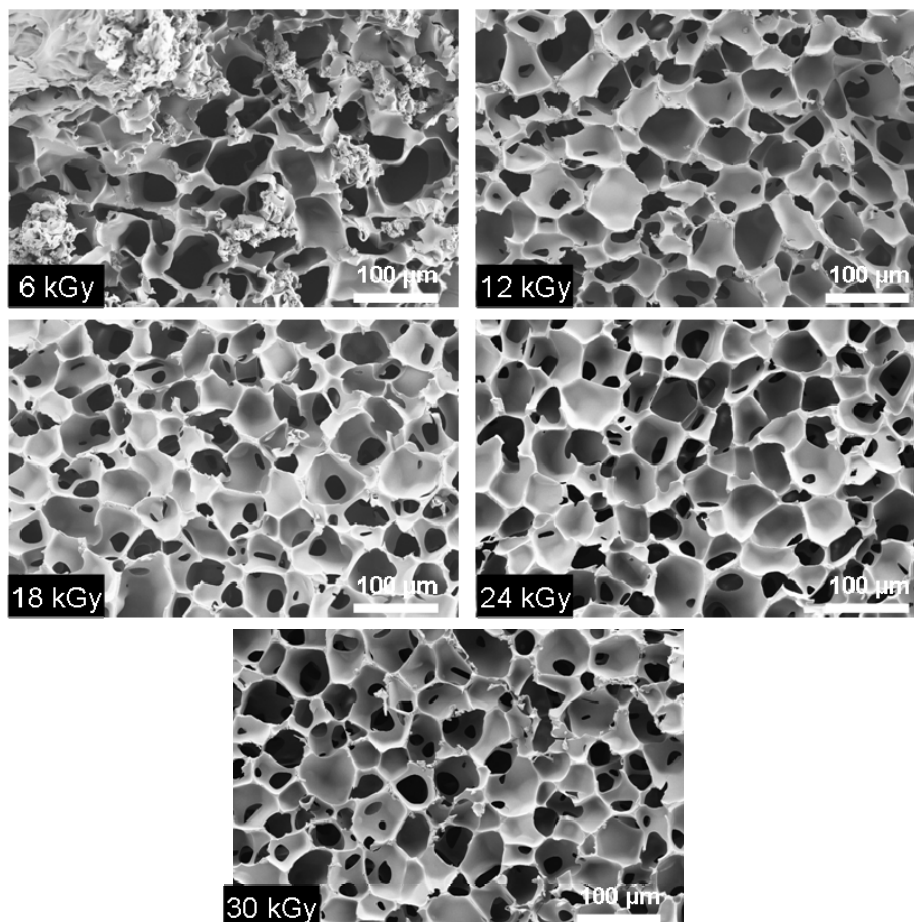


Fig. 1 SI SEM images of the morphology of MPC-B in dependence on the radiation dose

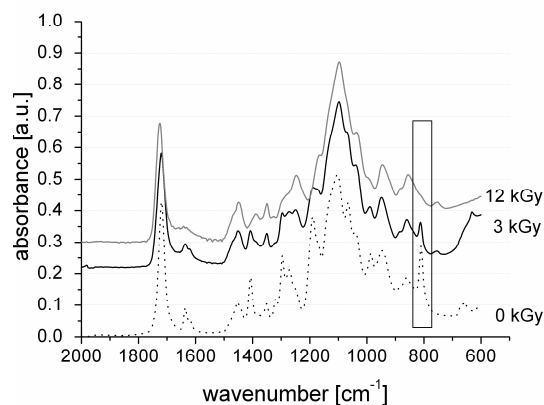
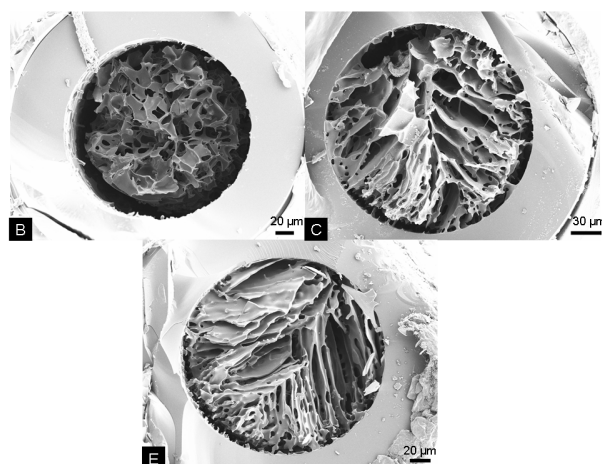
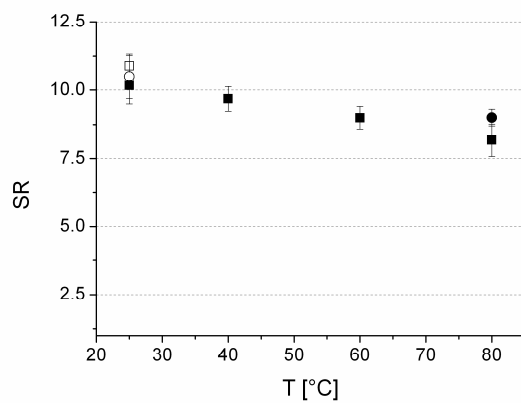


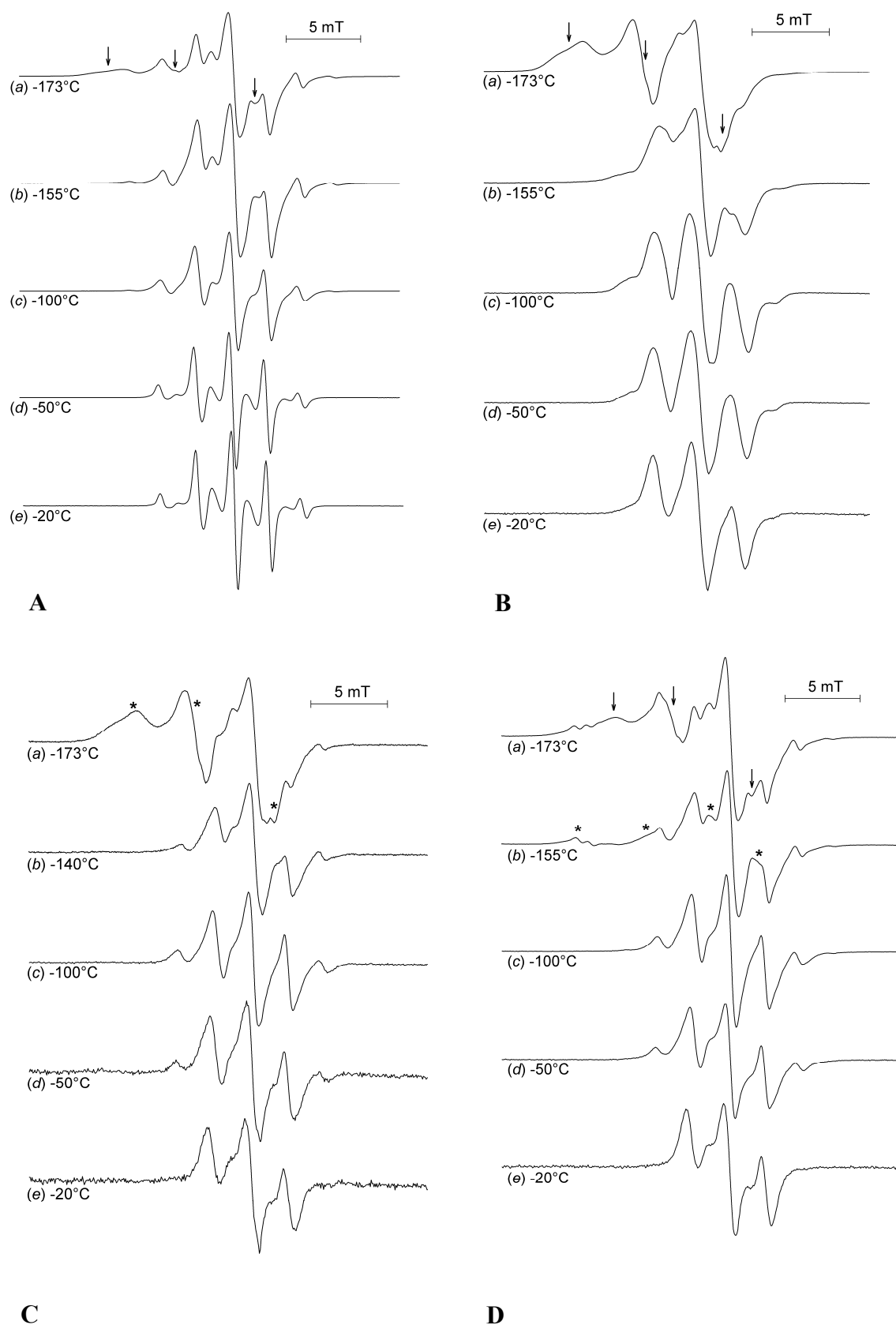
Fig. 2 SI FT-IR spectra of the pure acrylate formulation (—) and MPC-B irradiated at doses of 3 kGy (···) and 12 kGy (---). The box highlights the conversion of the double bond at 810 cm<sup>-1</sup>.



**Fig. 3** SI SEM images of MPC- B, MPC-C and MPC-E prepared in silanized fused silica capillaries (ID= 200 μm)



**Fig. 4** SI Temperature dependent swelling of MPC B, ■ 1. heating cycle, □ 1. cooling cycle (T = 25 °C), ● 2. heating cycle (T = 80 °C), ○ 2. cooling cycle (T = 25 °C)



**Fig 5** SI EPR spectra of frozen aqueous solutions of 10 wt.-% PEGMA (A) and 10 wt.-% TEGDA (B); 5 wt.-% PEGMA/ 5 wt.-% TEDGA (C) and 5 wt.-% PEGMA/ 5 wt.-% TEDGA / 5 wt.-% PAAm (D). The solutions were initially frozen at -20 °C to obtain the desired cryogel structure. Then, the samples were cooled down to -196 °C and irradiated at this temperature and measured at the temperatures indicated. This procedure prevents radical reactions which would proceed too fast at -20 °C to be measured. Hydroxyl radicals (marked with arrows) are present in the spectra below -155 °C, their decay does not lead to the formation of new radical species, i.e. it occurs by recombination. In

case of the methacrylate PEGMA (A) the propagating radical persists even at  $-20\text{ }^{\circ}\text{C}$  due to its lower reactivity. In case of TEGDA (B) polymerisation has already finished at  $-20\text{ }^{\circ}\text{C}$  and only a mid-chain (tertiary) radical remains. In solution containing PAAm an additional signal can be recognized (marked with asterisks at  $-155\text{ }^{\circ}\text{C}$ ) at temperatures below  $-123\text{ }^{\circ}\text{C}$ , which can be attributed tentatively to aminyl radicals.