Electronic Supplementary Material (ESI) for Nanoscale Advances.

A greener approach to synthesizing metal-decorated carbogels from alginate for emerging technologies

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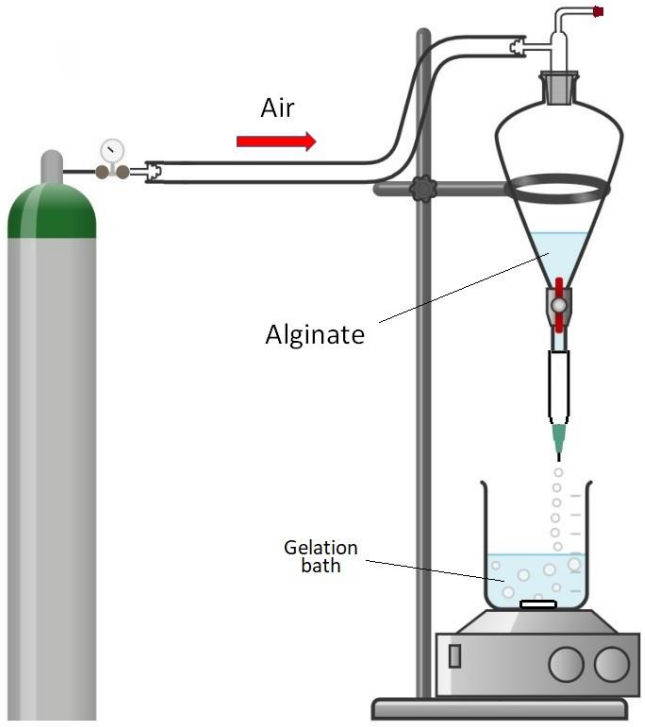

Fig. S1 Dripping device for production of alginate hydrogel beads.

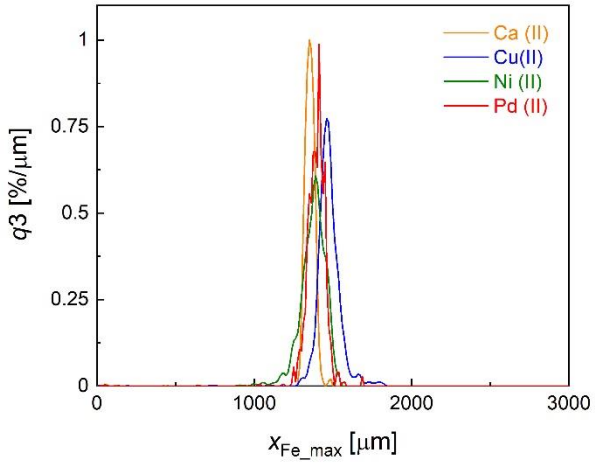

Fig. S2 Particle size distributions of M-CAs produced with different metal ions at c_m = 17 mmol/L. x_{Fe_max} corresponds to the longest ferret-diameter (see doi.org/10.1007/s10570-020-03555-2).

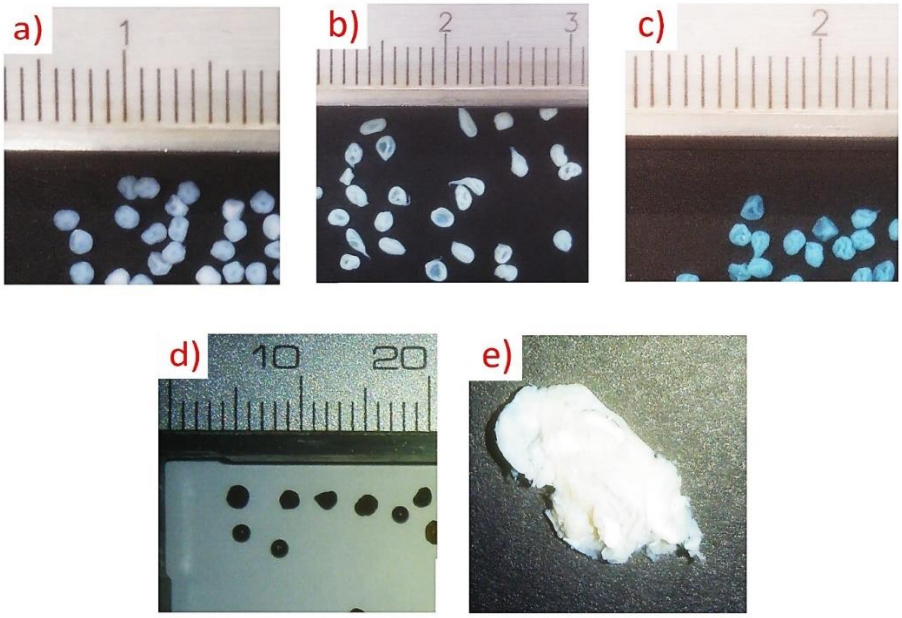

Fig. S3 M-CAs beads produced via crosslinking of alginate with different ions: a) Ca(II), b) Ni II), c) Cu(II), d) Pd(II) and e) Pt(IV) foam.

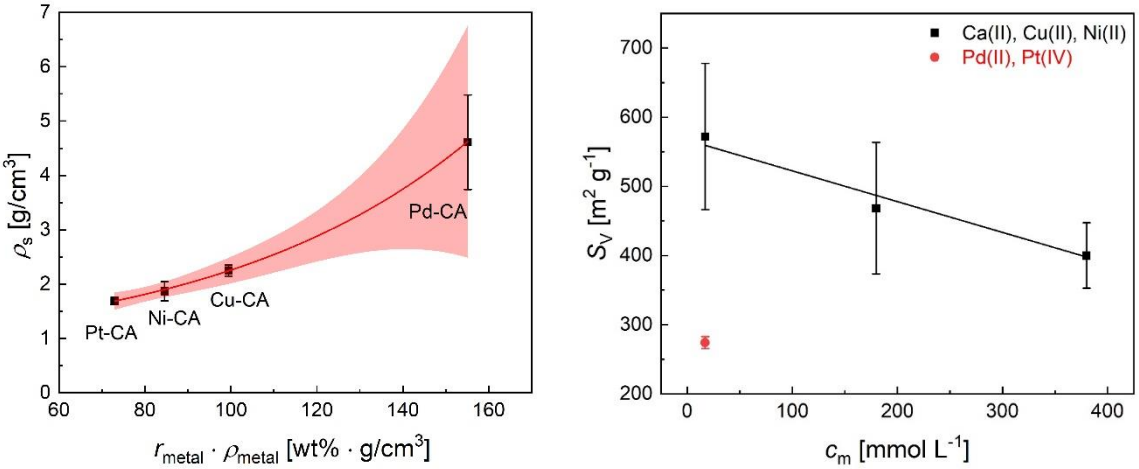

Fig. S4 Left: Skeletal density of different M-CAs in dependence of r_{metal} and parent metals density (Ni = 58.69 g/cm^3, Cu = 63.55 g/cm^3, Pd = 106.40 g/cm^3, Pt = 195.09 g/cm^3). Error bars correspond to standard deviation of skeletal density measurements, line to exponential fitting (R^2 0.998), highlighted area to the 95% confidence interval. Right: Specific surface area of M-CAs in dependence of metal salt concentration in the gelation bath. Values are averaged for different metal ions, error bars correspond to the standard deviation of the average.

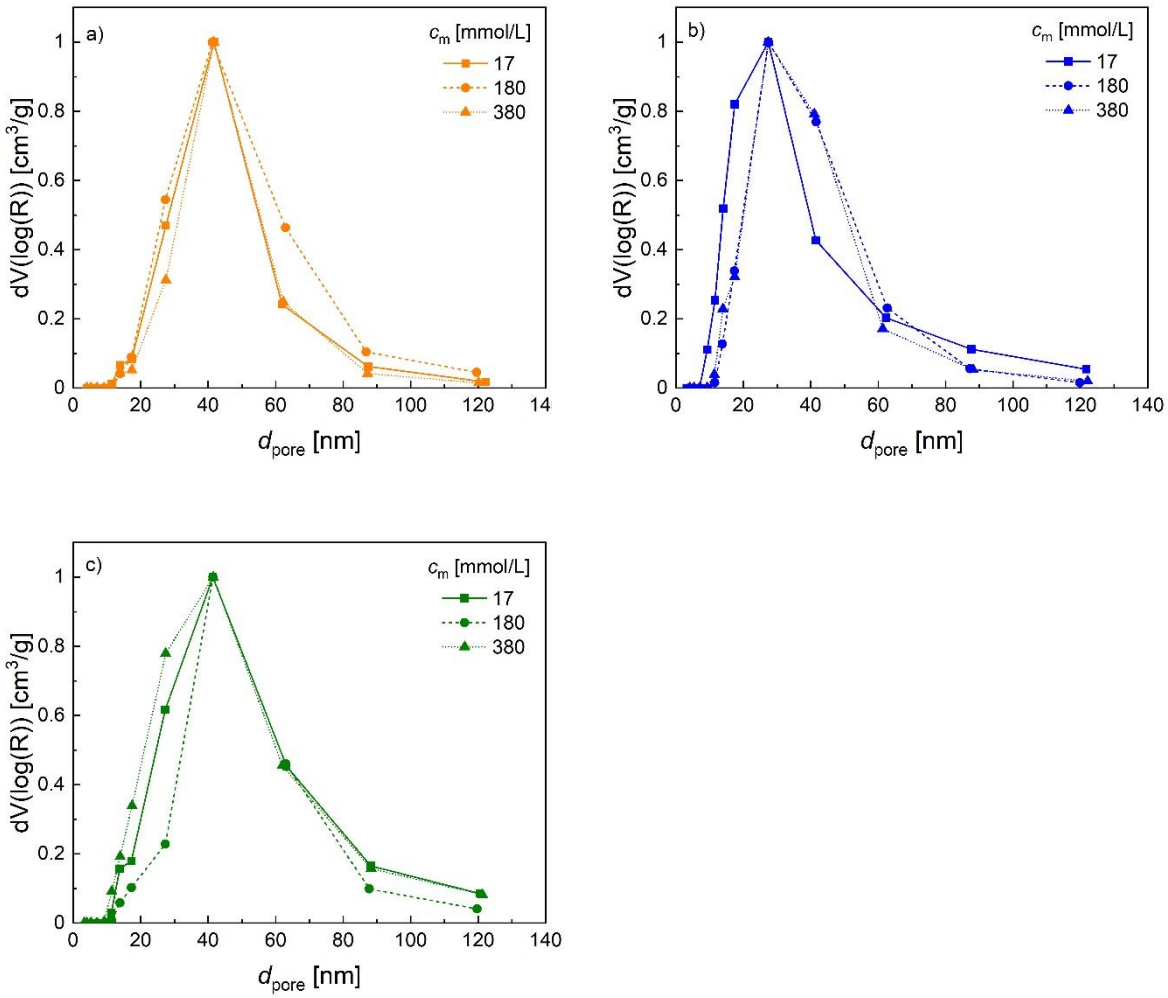

Fig. S5 Pore size distributions of M-CAs crosslinked with Ca(II) (a), Cu(II) (b) and Ni(II) (c) ions at different metal salt concentrations in the gelation bath (c_m). Lines are drawn to guide the eye.

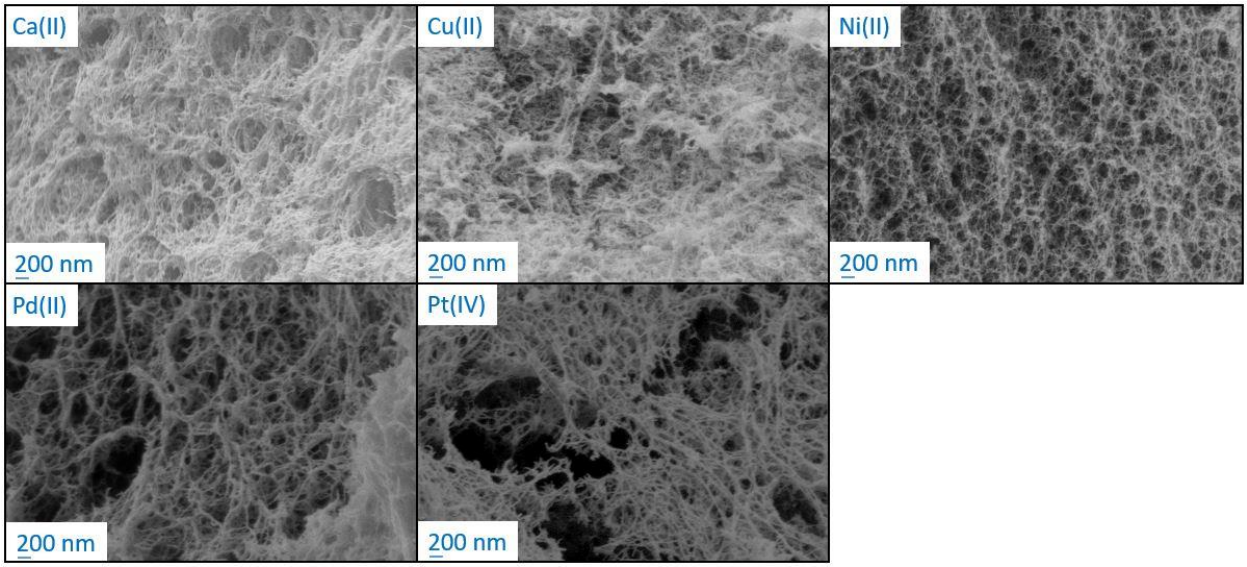

Fig. S6 SEM pictures of inner pore structures of alginate aerogels crosslinked with different metal ions at c_m = 17 mmol L^{-1}, magnification 50000 x.

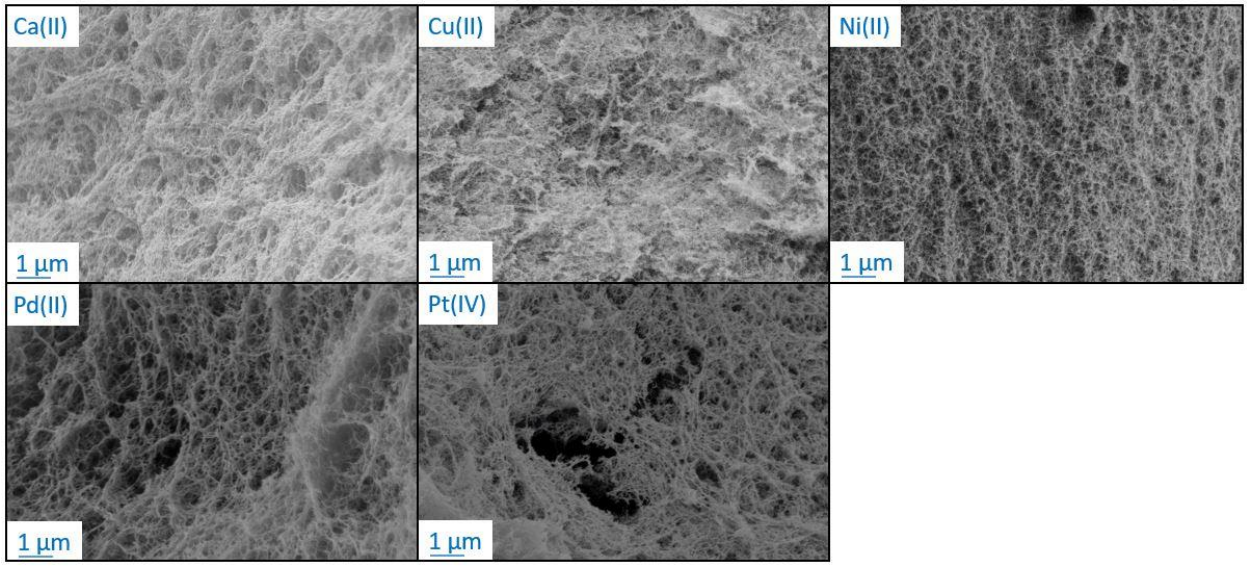

Fig. S7 SEM pictures of inner pore structures of alginate aerogels crosslinked with different metal ions at c_m = 17 mmol L^{-1}, magnification 25000 x.

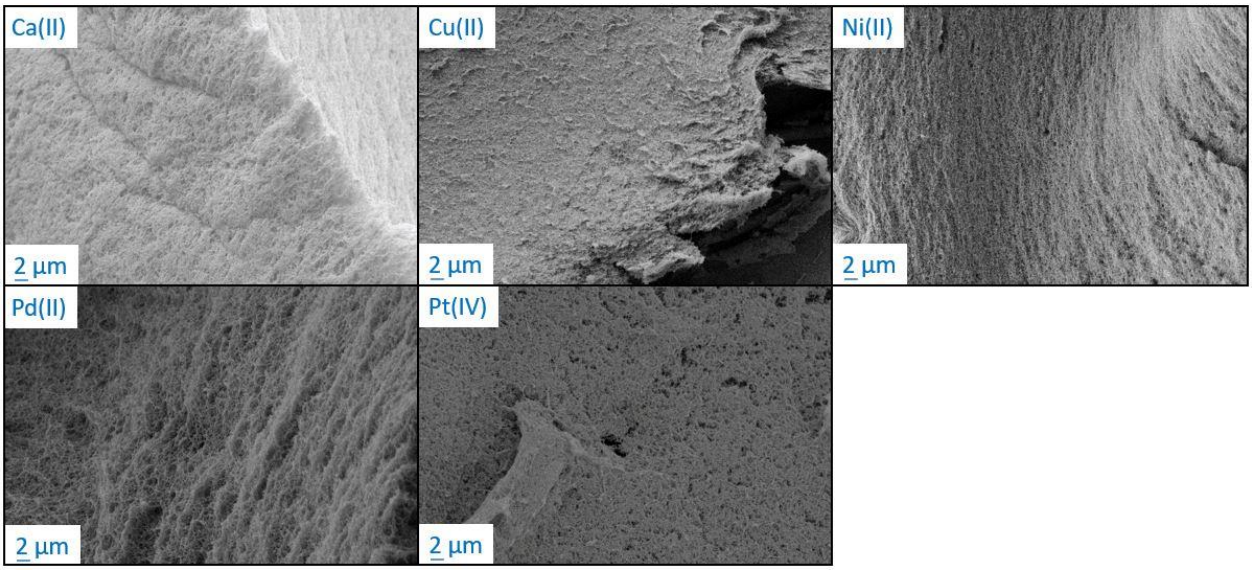

Fig. S8 SEM pictures of inner pore structures of alginate aerogels crosslinked with different metal ions at c_m = 17 mmol L^{-1}, magnification 5000 x.

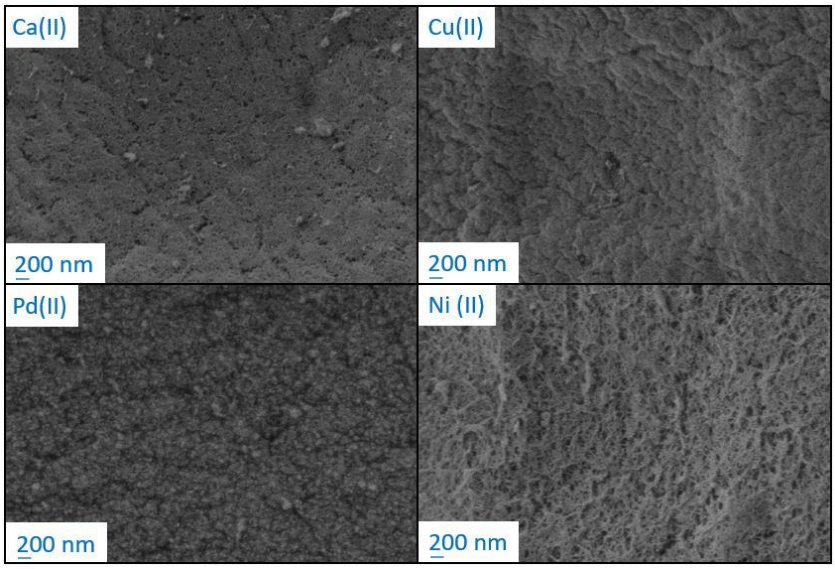

Fig. S9 SEM pictures of outer skin of alginate aerogels crosslinked with different metal ions at c_m = 17 mmol L^{-1}, magnification 50000 x.

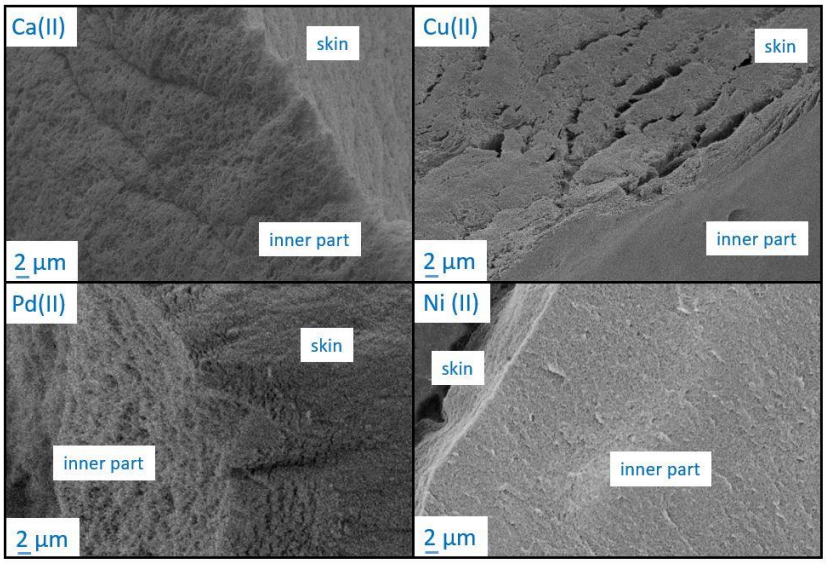

Fig. S10 SEM pictures of outer skin and inner pores of alginate aerogels crosslinked with different metal ions at c_m = 17 mmol L^{-1}, magnification 5000 x.

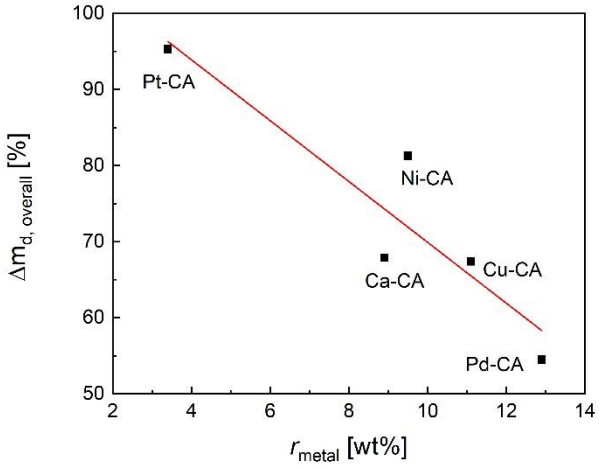

Fig. S11 Overall mass loss of M-CAs caused by pyrolysis up to T_P = 600 °C in dependence of r_{metal}. The straight line corresponds to linear fitting.

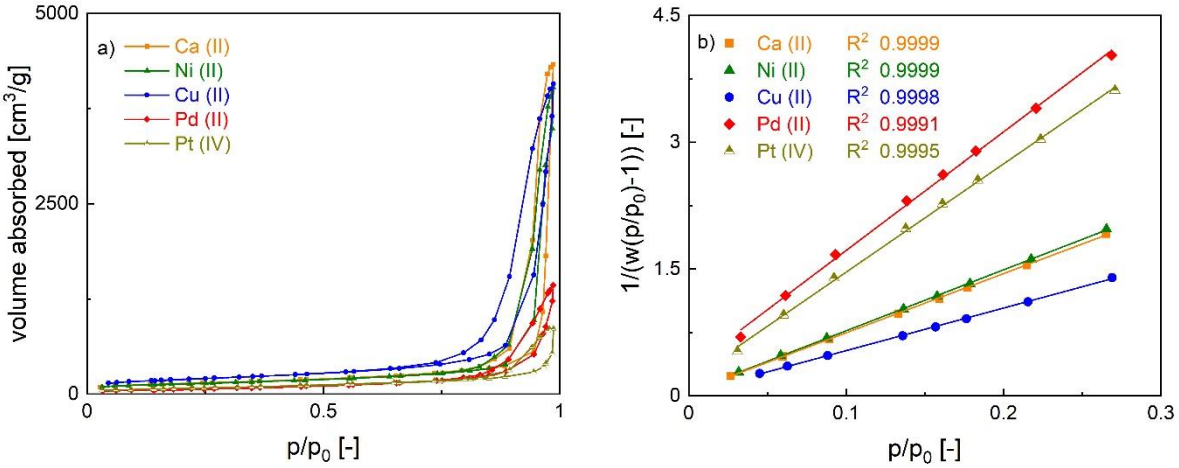

Fig. S12 Nitrogen-adsorption-desorption isotherms of M-CAs crosslinked with different metal ions (a) and according BET-plots (b).

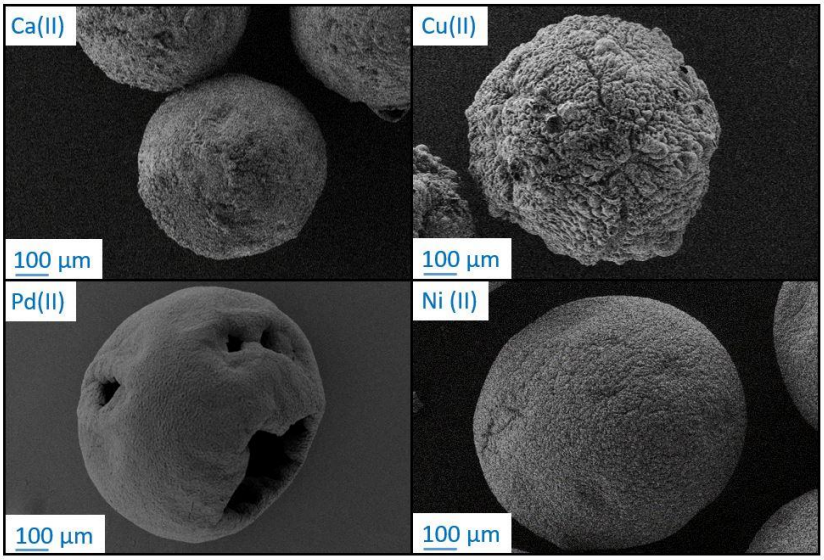

Fig. S13 M-DC beads produced via crosslinking of alginate with different metal ions, followed by pyrolysis (T_P = 600 °C).