



**Figure S1.** The XRD patterns of the sedimentary protolith (a) and CM rocks: slightly annealed rock (b), clinker (c), and paralava (d).

Chl = chlorite, Crd = cordierite, Crs = cristobalite, Ill = Illite, Hem = hematite, Phy = phyllosilicates (muscovite and mixed-layer illite-smectite), Pl = plagioclase, Py = pyrite, Qz = quartz, Sm = smectite, Ti-Mag = intermediate members of the magnetite-ulvöspinel solid solutions.