

<Supplementary Materials>

## Low-temperature self-healing of a microcapsule-type protective coating

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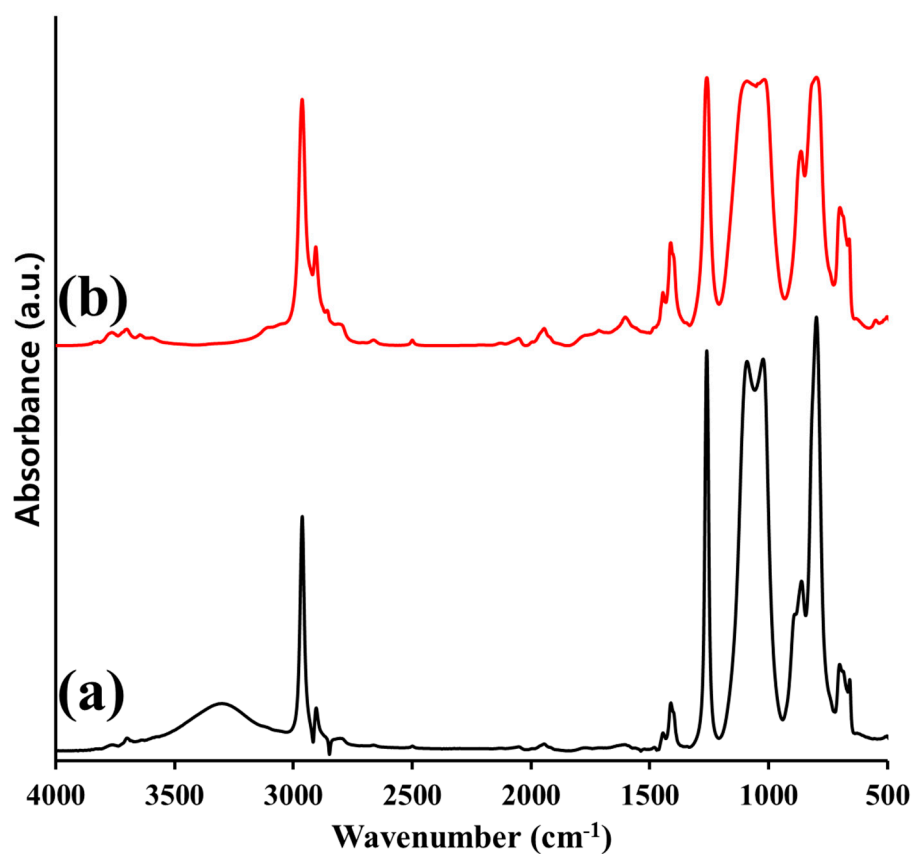


Figure S1. FT-IR spectra of STP (a) before and (b) after reaction at -20°C for 19 days.

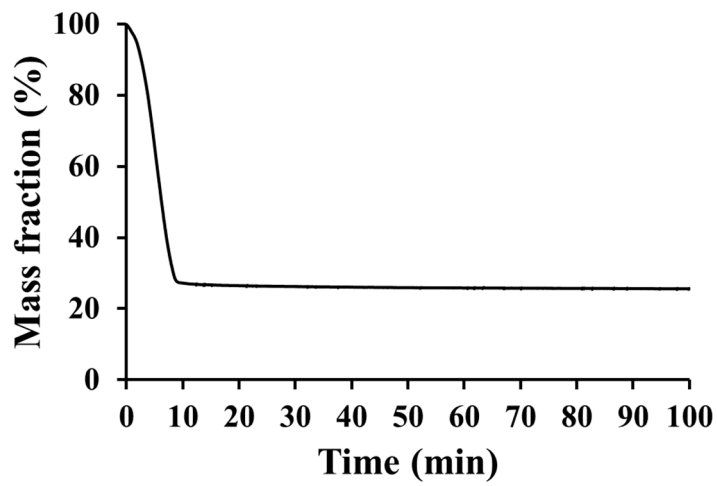


Figure S2. Isothermal (25°C) TGA thermogram of ruptured DD microcapsules.

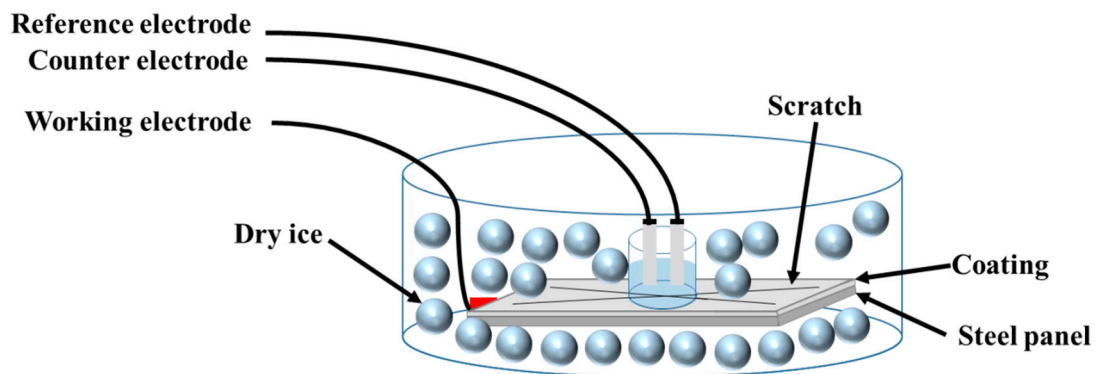


Figure S3. Schematic diagram of electrochemical test at low temperature (-20°C).

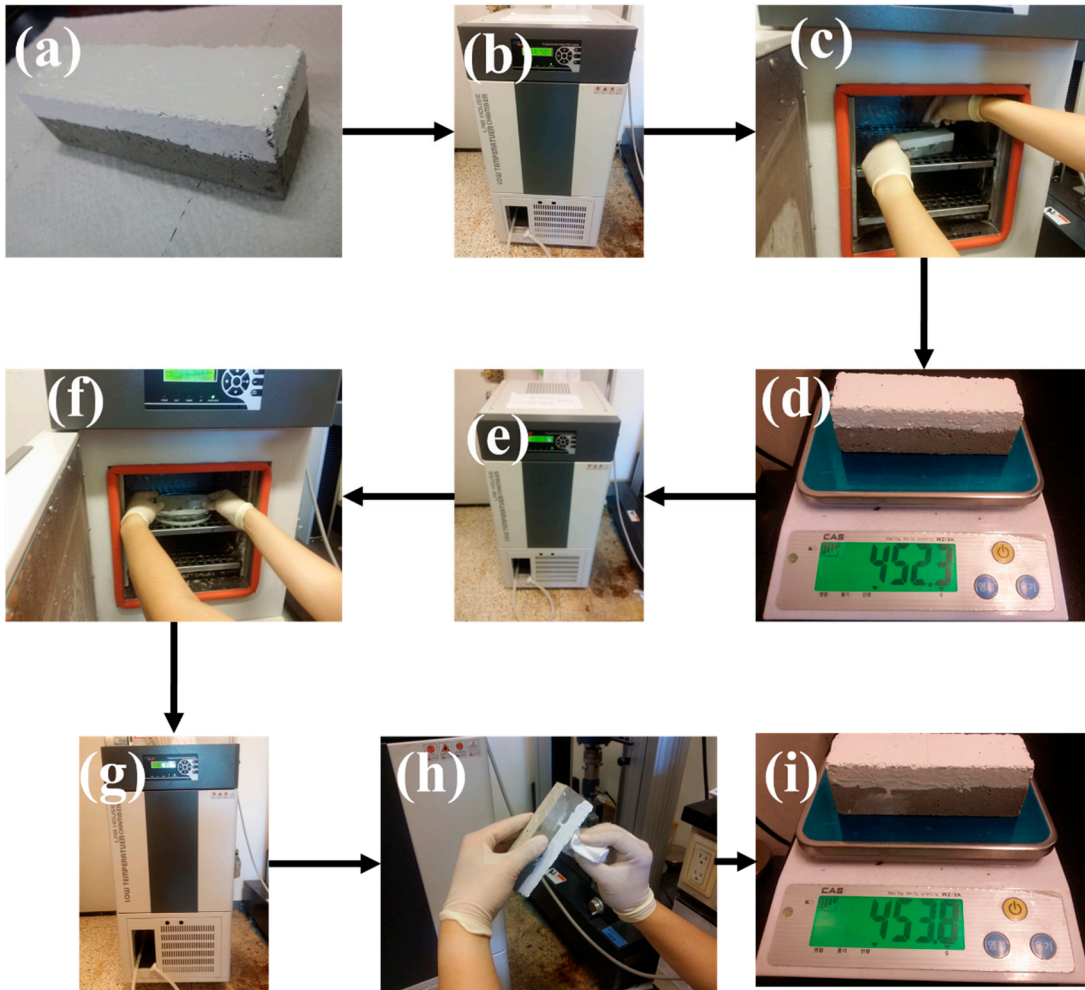


Figure S4. Procedure for saline solution permeability test: (a) coating on a mortar specimen; (b) storing the coated mortar specimen at  $-20^{\circ}\text{C}$  in a low-temperature chamber for 24 h; (c) scratching the coated mortar specimen; (d) weighing; (e) storing the specimen at  $-20^{\circ}\text{C}$  in the chamber for 12 h; (f) immersion of the coated side of the specimen in saline solution; (g) storing the specimen at  $-20^{\circ}\text{C}$  in the chamber for 48 h; (h) taking the specimen out of the saline solution and wiping the immersed surface; (i) weighing.