

Supporting Information

Characterization and Drug Release Behavior of Chip-like Amphiphilic Chitosan-Silica Hybrid Hydrogel for Electrically-modulated Release of Ethosuximide: an in-vitro study

Wei-Chen Huang, Tai-Jung Lee, Chi-Sheng Hsiao, San-Yuan Chen*

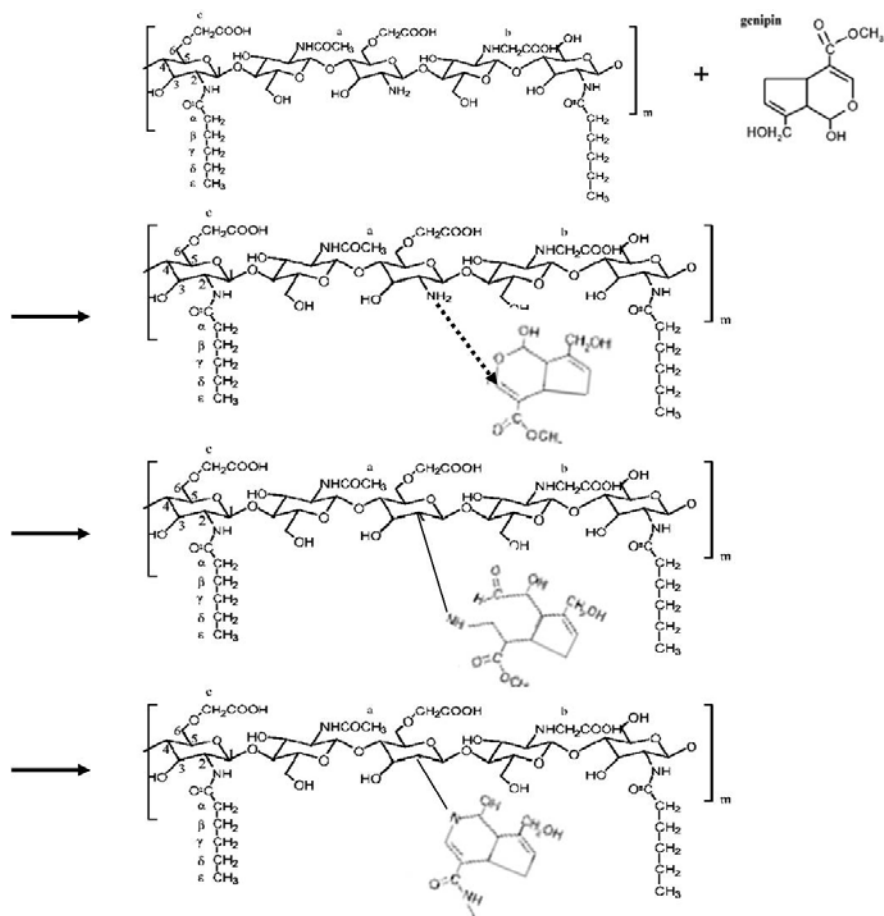
and Dean-Mo Liu*

Department of Materials Sciences and Engineering, National Chiao Tung University, Hsinchu, Taiwan

The CHC hybrid hydrogels were synthesised by combining Genipin-crosslinked CHC together with acid-hydrolyzed TEOS in different ratio of composition. The synthetic procedure was described as follows.

In the first step, the synthesis of genipin-crosslinked CHC network is originated from nucleophilic attack by amino group of CHC toward the olefinic carbon atom at C-3 of deoxyloganin aglycone followed by the opening of the dihydropyran ring to form heterocyclic amine (Figure S1(a)). The conformation of the network segments of genipin-crosslinked CHC gels depends on the added amount of genipin. In the second step (Figure S1(b)), after genipin-crosslinked CHC network was formed, acid-hydrolyzed TEOS was added to complete sol-gel reaction.

Step 1 : Genipin-crosslinked CHC network



(b)

Step 2. acid-hydrolyzed TEOS

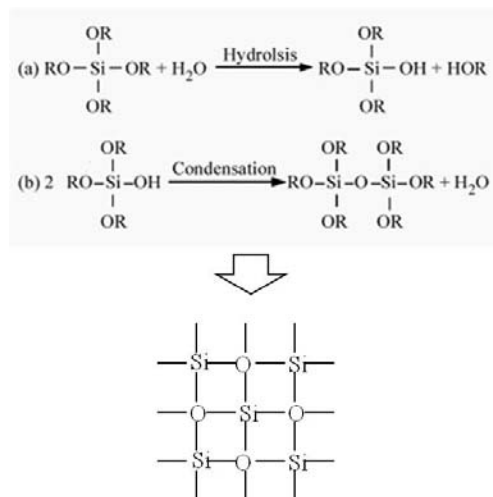


Figure S1 Structural illustration of (a) Genipin-crosslinked CHC network (b) acid-hydrolyzed tetraethoxysilane (TEOS) by mixing TEOS with ethanol and HCl acidified H₂O.

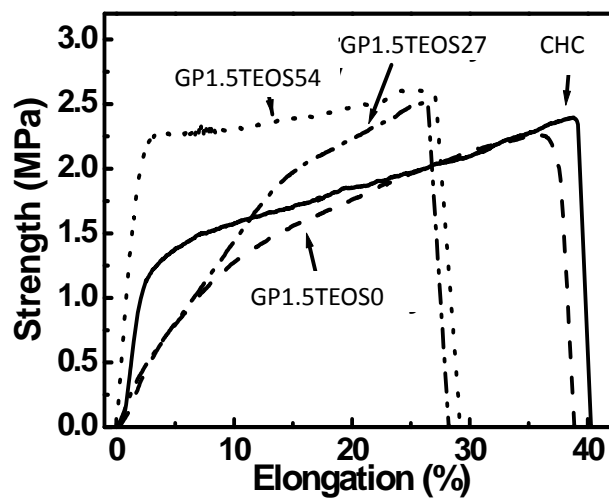


Figure S2 Mechanical enhancement to the hybrid hydrogels can then be expected with higher TEOS content.

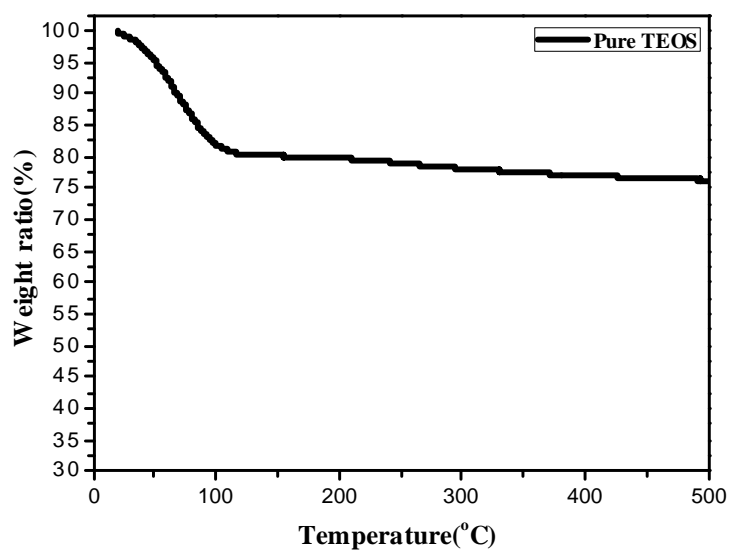
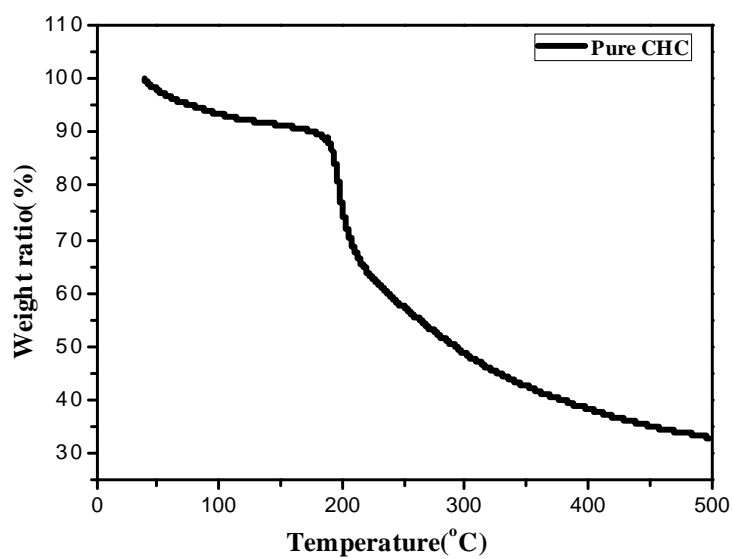


Figure S3 TG curves for pure CHC and pure TEOS.