Supporting Information

Layered composite based on halloysite and natural polymers: a carrier for pH controlled release of drugs

Lorenzo Lisuzzo[a], Giuseppe Cavallaro[a,b], Stefana Milioto[a,b], Giuseppe Lazzara[a,b,*]

[a]*Dipartimento di Fisica e Chimica, Università degli Studi di Palermo, Viale delle Scienze, pad. 17, 90128 Palermo, Italy. giuseppe.lazzara@unipa.it*

[b]*Consorzio Interuniversitario Nazionale per la Scienza e Tecnologia dei Materiali, INSTM, Via G. Giusti, 9, I-50121 Firenze, Italy*

Drug loading calculation details from thermogravimetric analysis.

The rule of mixtures for the degraded samples at 700 °C (MD_{700}) was used in order to calculate the amount of diclofenac loaded into the nanotubes.

As a general equation, MD_{700} can be estimated as

$$MD_{700} = 100 - (MR_{700} + ML_{150}) \quad (1)$$

where MR_{700} is the residual matter at 700 °C, while ML_{150} is the mass amount that was lost from 25 to 150 °C. ML_{150} represents the water content of the investigated material.

As concerns the nanoclays loaded with the drug, the degraded matter at 700 °C ($MD_{700\text{-}NG}$) can be expressed as

$$MD_{700\text{-}NG} = (C_N \cdot MD_{700\text{-}N} + C_G \cdot MD_{700\text{-}G})/100 \quad (2)$$

where C_N and C_G are the weight percents of nanoclay and guest molecule, respectively, while $MD_{700\text{-}N}$ and $MD_{700\text{-}G}$ are the degraded matters at 700 °C for the corresponding pristine components.

By the combination of the equations 1,2, C_N can be calculated as

$$C_N = 100 \cdot (MR_{700\text{-}G} + ML_{150\text{-}G} - MR_{700\text{-}N} - ML_{150\text{-}N})/(MR_{700\text{-}G} + ML_{150\text{-}G} - MR_{700\text{-}G} - ML_{150\text{-}N}) \quad (3)$$

C_G can be determined as

$$C_G = 100 - C_N \quad (4)$$

UV-VIS calibration results for the drug at variable pH conditions.

Table S1 reports the extinction coefficients (ε) of diclofenac measured at the three different pH values, previously to release studies.

pH	**ε** (100 ml g^{-1})
3	187.2
5.7	311.0
7.8	301.1