SUPLEMENTARY MATERIAL

# Influence of organic-modified inorganic matrices on the optical properties of palygorskite-curcumin type hybrid materials

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**Table S1.** The XRD peaks corresponding to the palygorskite structure

| No. | 2Theta | Phase name | h | k | l | No. | 2Theta | Phase name | h | k | l |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 8.58 | Palygorskite | 1 | 1 | 0 | **16** | 38.76 | Palygorskite | 1 | 1 | 2 |
| **2** | 13.82 | Palygorskite | 2 | 0 | -1 | **17** | 39.46 | Palygorskite | 3 | 5 | 1 |
| | | | | | | | | Quartz | 1 | 0 | 2 |
| **3** | 16.38 | Palygorskite | 2 | 2 | 0 | **18** | 40.34 | Palygorskite | 0 | 8 | 0 |
| | | | | | | | | Quartz | 1 | 1 | 1 |
| **4** | 19.84 | Palygorskite | 0 | 4 | 0 | **19** | 41.92 | Palygorskite | -4 | 6 | 1 |
| **5** | 20.88 | Palygorskite | 0 | 2 | 1 | **20** | 50.22 | Palygorskite | -7 | 1 | 5 |
| | | Quartz | 1 | 0 | 0 | | | Quartz | 1 | 1 | 2 |
| **6** | 21.32 | Palygorskite | -2 | 2 | 1 | **21** | 54.84 | Palygorskite | -7 | 5 | 1 |
| **7** | 24.14 | Palygorskite | 2 | 4 | 0 | **22** | 57.34 | Palygorskite | 8 | 0 | 0 |
| | | | | | | | | Quartz | 2 | 1 | 0 |
| **8** | 25.72 | Palygorskite | 1 | 3 | 1 | **23** | 60.56 | Palygorskite | -7 | 7 | 3 |
| | | | | | | | | Quartz | 2 | 1 | 1 |
| **9** | 26.62 | Palygorskite | 2 | 2 | 1 | **24** | 61.56 | Palygorskite | -2 | 6 | 3 |
| | | Quartz | 1 | 0 | 1 | | | | | | |
| **10** | 27.52 | Palygorskite | -3 | 3 | 1 | **25** | 68.08 | Palygorskite | 5 | 7 | -9 |
| **11** | 29.44 | Palygorskite | -4 | 2 | 1 | **26** | 72.60 | Palygorskite | 2 | 10 | -8 |
| **12** | 30.86 | Palygorskite | -1 | 5 | 1 | **27** | 75.79 | Palygorskite | 1 | 3 | -12 |
| **13** | 34.4 | Palygorskite | -3 | 5 | 1 | **28** | 79.97 | Palygorskite | 10 | 6 | -6 |
| **14** | 35.26 | Palygorskite | 0 | 0 | 2 | **29** | 81.45 | Palygorskite | 11 | 3 | -6 |
| **15** | 36.64 | Palygorskite | -2 | 6 | 1 | | | | | | |
| | | Quartz | 1 | 1 | 0 | | | | | | |

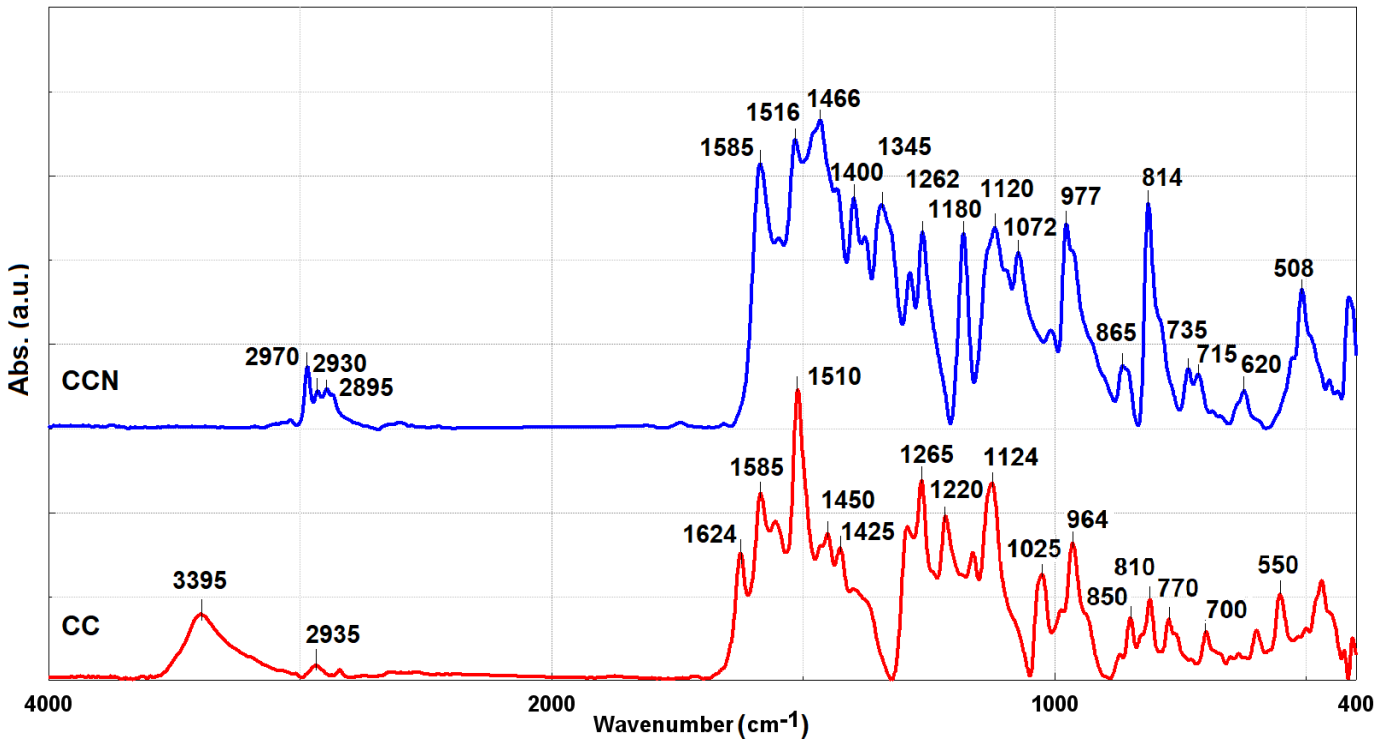


**Figure S1.** FTIR spectra of the curcumin dyes [39]

The total difference between the two colors is given in terms of L*, a*, b* by the CIE 1976 formula:

$$\Delta E^*_{ab} = [(\Delta L^*)^2+(\Delta a^*)^2+(\Delta b^*)^2]^{1/2} \quad (1)$$

**Table S2.** Color differences for hybrid colored materials, exposed to various environmental factors.

| Sample | ΔL* | Δa* | Δb* | ΔE* | ΔC* | ΔH |
|---|---|---|---|---|---|---|
| S1-CC (t) | 20,99 | -20,20 | -15,24 | 32,87 | -21,94 | 12,60 |
| S1-CC (a) | 18,34 | -23,28 | -26,10 | 39,49 | -33,12 | 11,23 |
| S1-CC (H+) | 6,67 | -13,91 | 8,81 | 17,76 | 2,87 | 16,21 |
| S1-CC(NaCl) | 0,34 | -3,06 | 0,16 | 3,09 | -1,43 | 2,71 |
| S2-CC (t) | -3,13 | 3,38 | -10,90 | 11,84 | -11,18 | 2,30 |
| S2-CC (a) | -6,37 | 6,06 | -27,25 | 28,64 | -27,54 | 4,56 |
| S2-CC (H+) | -3,19 | 4,39 | -9,09 | 10,59 | -9,41 | 3,65 |
| S2-CC(NaCl) | -1,57 | 2,70 | -7,56 | 8,18 | -7,80 | 1,91 |
| S1-CCN (t) | 0,97 | -0,21 | 3,83 | 3,95 | 3,27 | 2,00 |
| S1-CCN (a) | -17,29 | 5,92 | -15,94 | 24,25 | -8,19 | 14,90 |
| S1-CCN (H+) | -14,11 | 2,78 | -16,18 | 21,65 | -10,80 | 12,36 |
| S1-CCN (NaCl) | -1,20 | -0,84 | 1,50 | 2,10 | 0,91 | 1,46 |
| S2-CCN (t) | -3,40 | 1,47 | 5,06 | 6,27 | 4,30 | 3,03 |
| S2-CCN (a) | -21,21 | 2,11 | -2,27 | 21,44 | 0,61 | 3,05 |
| S2-CCN (H+) | -16,13 | 8,41 | 5,53 | 19,01 | 10,06 | 0,28 |
| S2-CCN (NaCl) | -12,92 | 11,66 | 9,02 | 19,60 | 14,73 | 0,52 |