Supplementary information for

Functional Mesoporous Alumosilicate Nanoparticles as Host Material to Fabricate Photo-switchable Polymer Films

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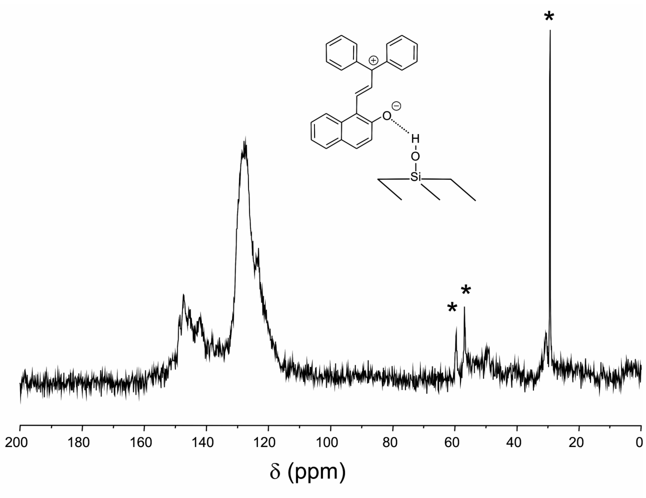
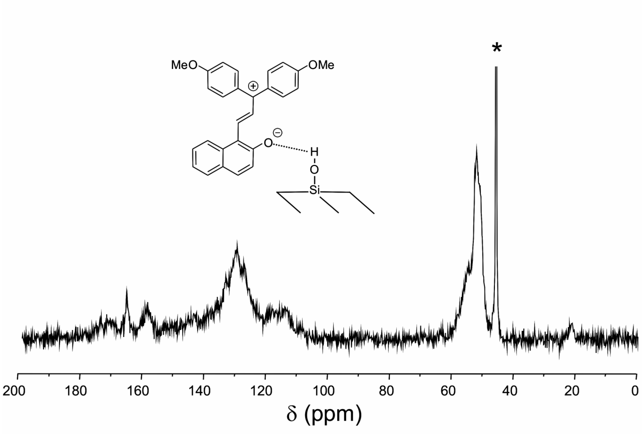
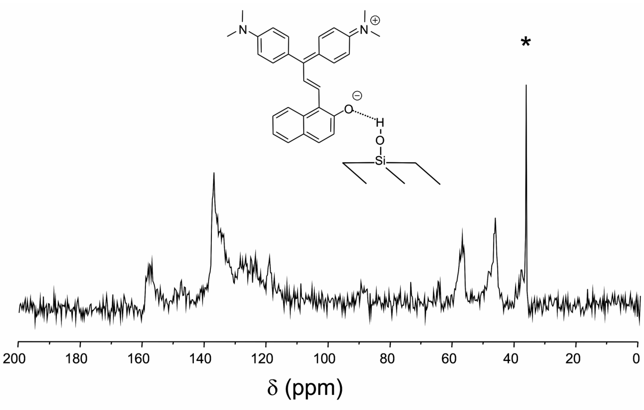
Content:

- ^{13}C-{^{1}H}-CP-MAS NMR spectra of faujasite materials after SIBOR of **1**, **2**, and **3** inside the supercages
- AM_1 calculations of the open, colored forms of photochromic molecules **1**, **2**, and **3**
- DRIFT spectra of the faujasites, photochromic dyes **1**, **2**, and **3**, and of the dye-loaded Y zeolites
- UV/Vis spectra of photochromic dyes **1**, **2**, and **3** in acidic solvents
- Using $Fe(phen)_2(CN)_2$ as established solvatochromic surface polarity probe
- Bleaching kinetics and fitted curves with I_1, I_2, I_∞, s_1 and s_2 being the fitting parameters
- UV/Vis spectra of polyethylene films doped with dye-loaded alumosilica particles

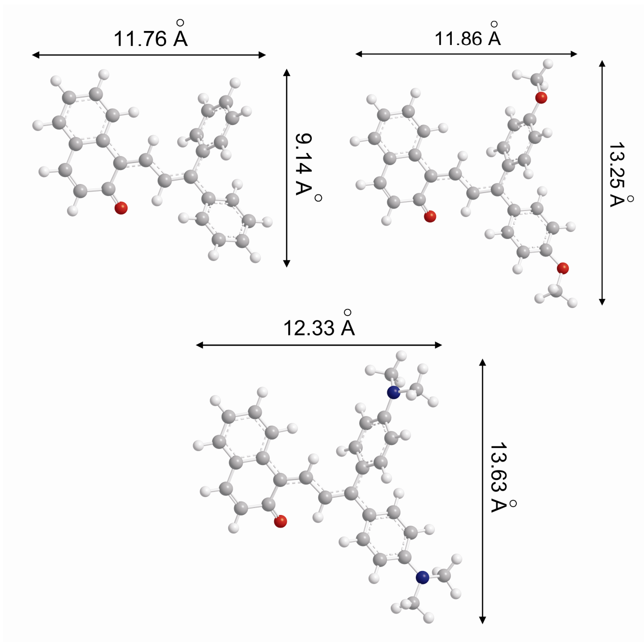
*^{13}C-{^{1}H}-CP-MAS NMR spectra of faujasite materials after SIBOR of **1**, **2**, and **3** inside the supercages (Asterisks indicates residual solvents used during the SIBOR).*



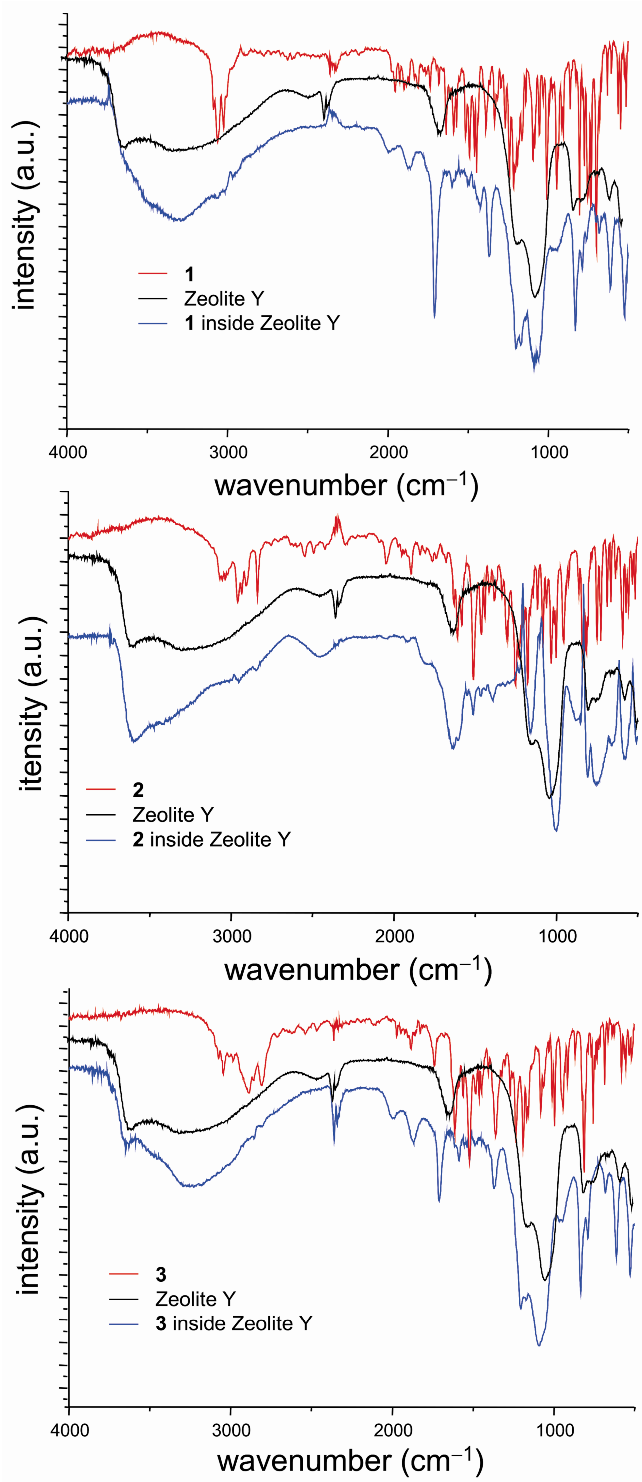




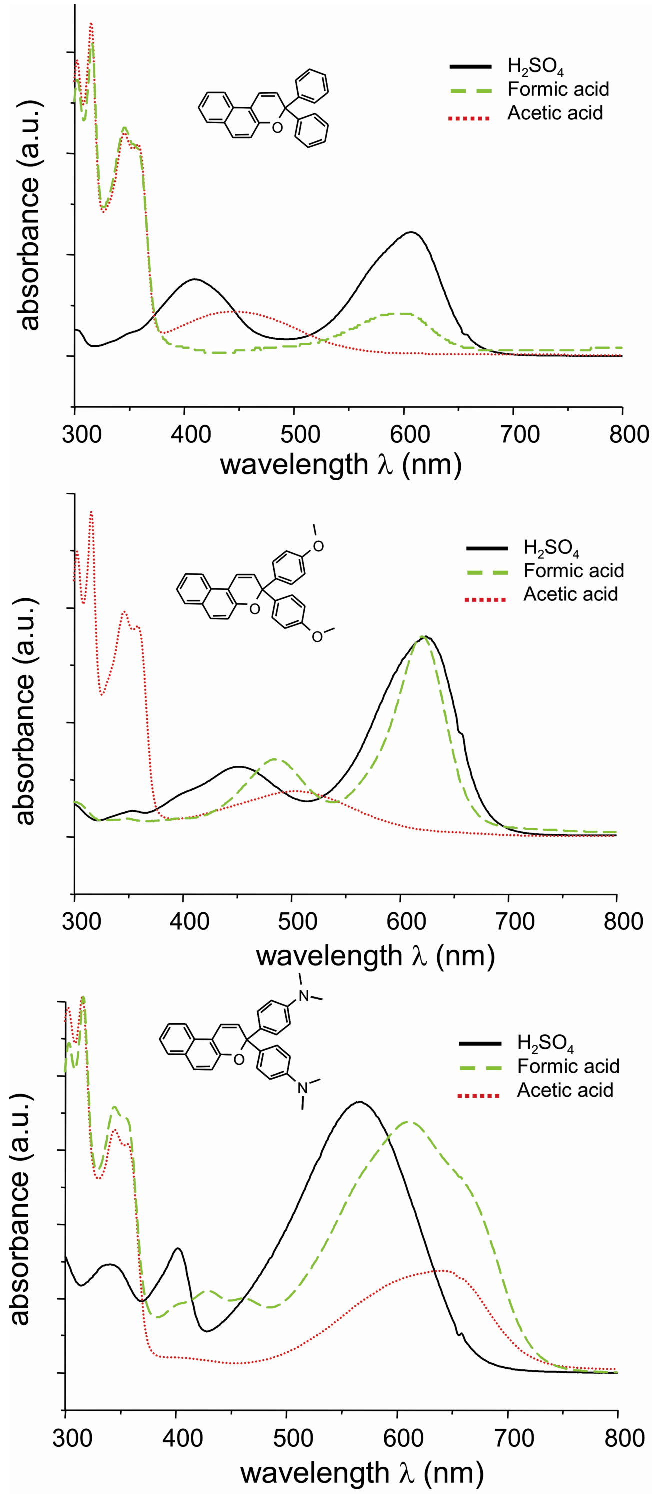
*AM$_1$ calculations of the open, colored forms of photochromic molecules **1**, **2**, and **3***:



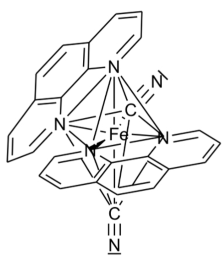
*DRIFT spectra of the faujasites, photochromic dyes **1**, **2**, and **3**, and of the dye-loaded Y zeolites*:



*UV/Vis spectra of photochromic dyes **1**, **2**, and **3** in acidic solvents*:



Using Fe(phen)$_2$(CN)$_2$ as established solvatochromic surface polarity probe:



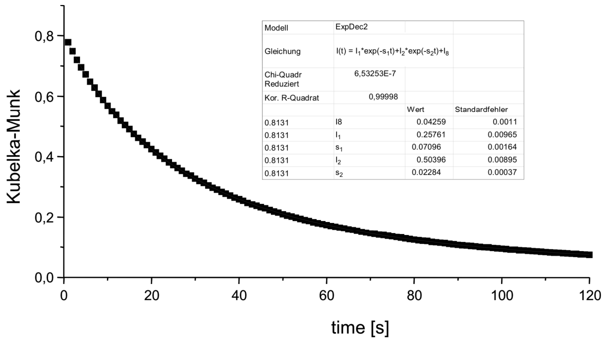
Equation 1 was used to determine the Kamlet-Taft parameter α.

$$\alpha = -7.49 + 0.46\tilde{\nu}_{max}([Fe(phen)_2(CN)_2]) \times 10^{-3}\,cm^{-1}$$
$$n = 26;\ r = 0.96;\ sd = 0.15;\ F < 0.0001 \qquad \textbf{(1)}$$

Host	λ_{max} [nm]	$\nu_{max} \cdot 10^{-3}[cm^{-1}]$	α
zeolite HY	500	20.00	1.71
zeolite DAY	516	19.38	1.43
MCM 41	510	19.61	1.53
MCM 48	529	18.91	1.21

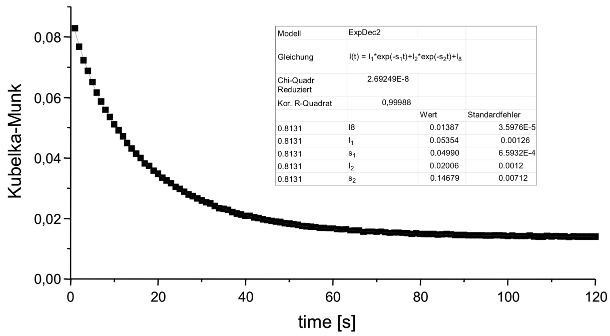
Bleaching kinetics and fitted curves with I_1, I_2, I_∞, s_1 and s_2 being the fitting parameters.

A)



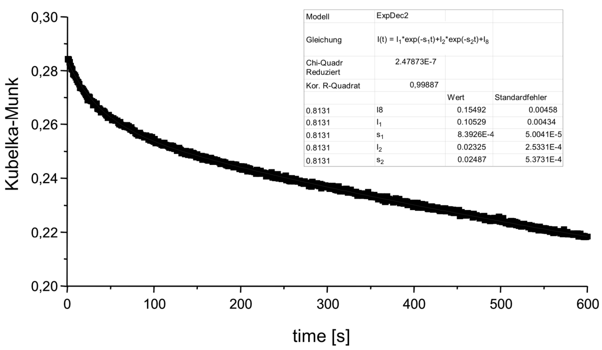
A) Loss in intensity of absorption at 450 nm over time for irradiated dye **1** (10 wt%) in MCM 41S (■ experimental data, — fit)

B)



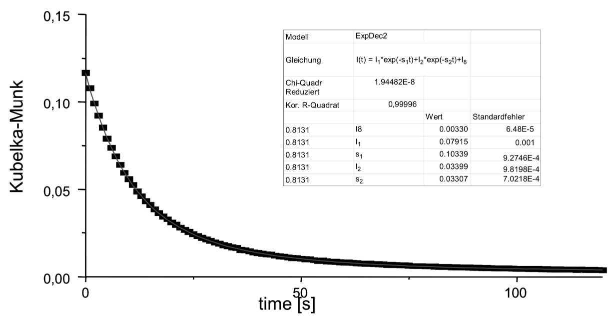
B) Loss in intensity of absorption at 495 nm over time for irradiate dye **2** (10 wt%) in MCM 41S (■ experimental data, — fit)

C)



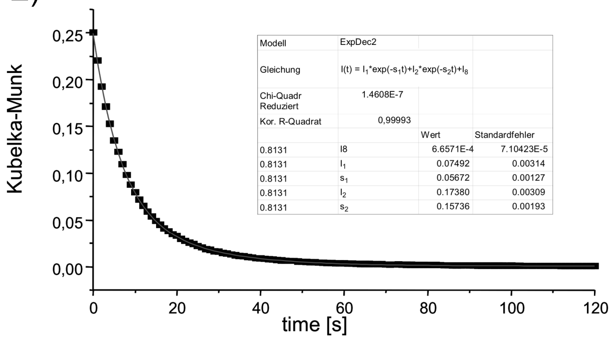
C) Loss in intensity of absorption at 550 nm over time for irradiated dye **3** (10 wt%) in MCM 41S (■ experimental data, — fit)

D)



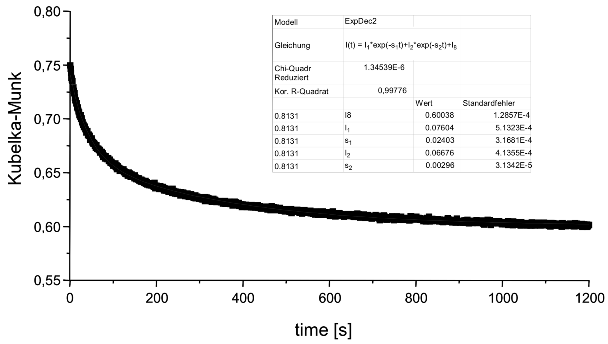
D) Loss in intensity of absorption at 450 nm over time for irradiate dye **1** (10 wt%) in MCM 48S (■ experimental data, — fit)

E)



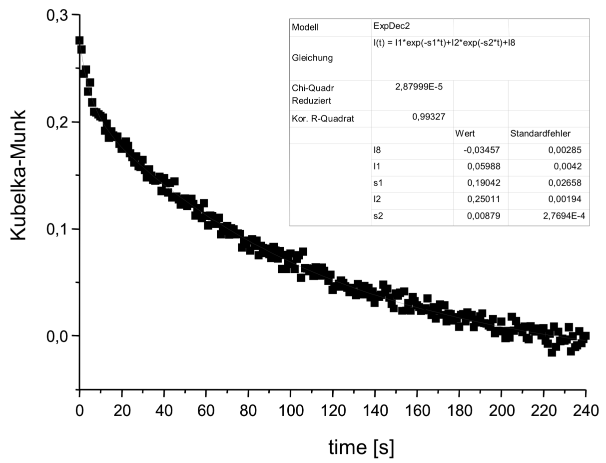
E) Loss in intensity of absorption at 495 nm over time for irradiated dye **2** (10 wt%) in MCM 48S (■ experimental data, ‒ fit)

F)



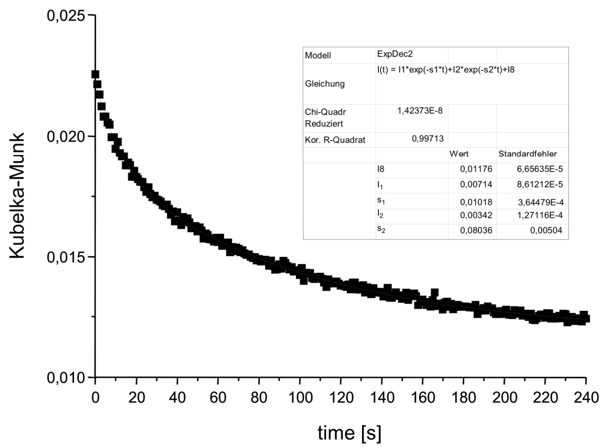
F) Loss in intensity of absorption at 550 nm over time for irradiate dye **3** (10 wt%) in MCM 48S (■ experimental data, ‒ fit)

G)



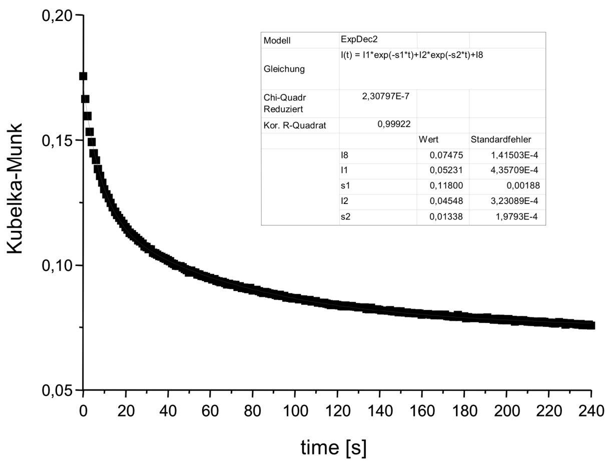
G) Loss in intensity of absorption at 450 nm over time for irradiated film doped with 2 wt% MCM 41S particles containing **1** (■ experimental data, ‒ fit)

H)



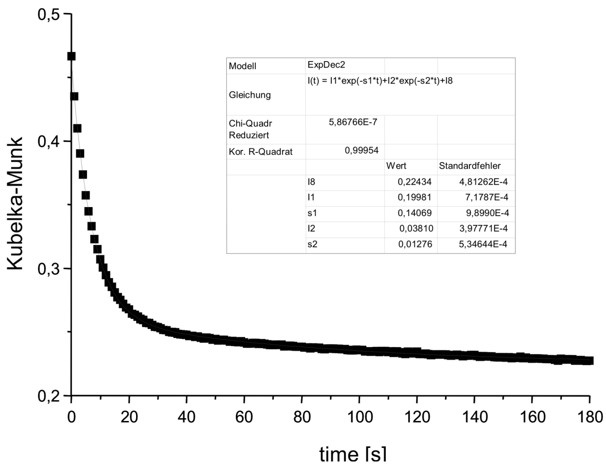
H) Loss in intensity of absorption at 490 nm over time for PE irradiated film doped with 2 wt% MCM 41S particles containing **2** (■ experimental data, ‒ fit)

I)



I) Loss in intensity of absorption at 450 nm over time for irradiated film doped with 2 wt% MCM 48S particles containing **1**

J)

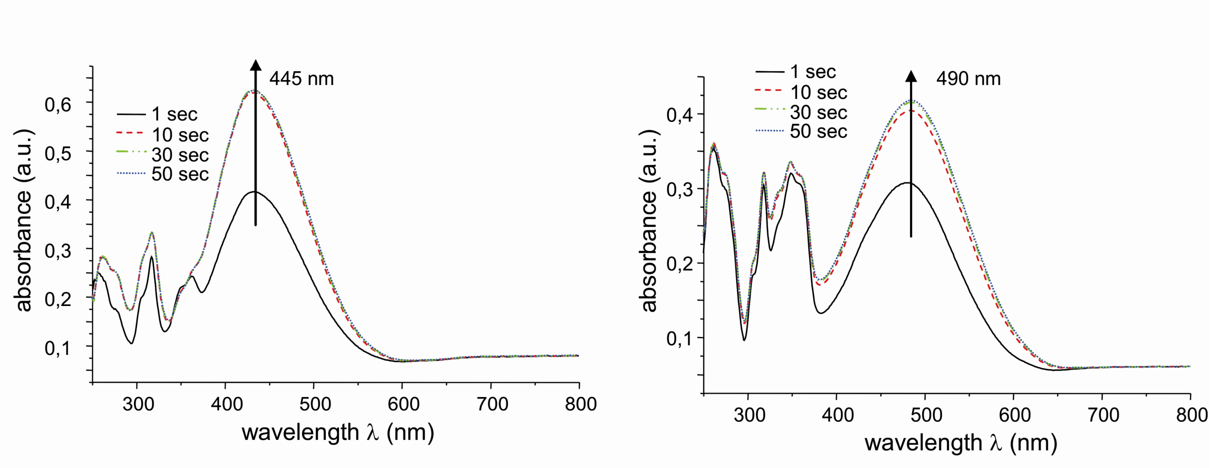


J) Loss in intensity of absorption at 490 nm over time for PE irradiated film doped with 2 wt% MCM 48S particles

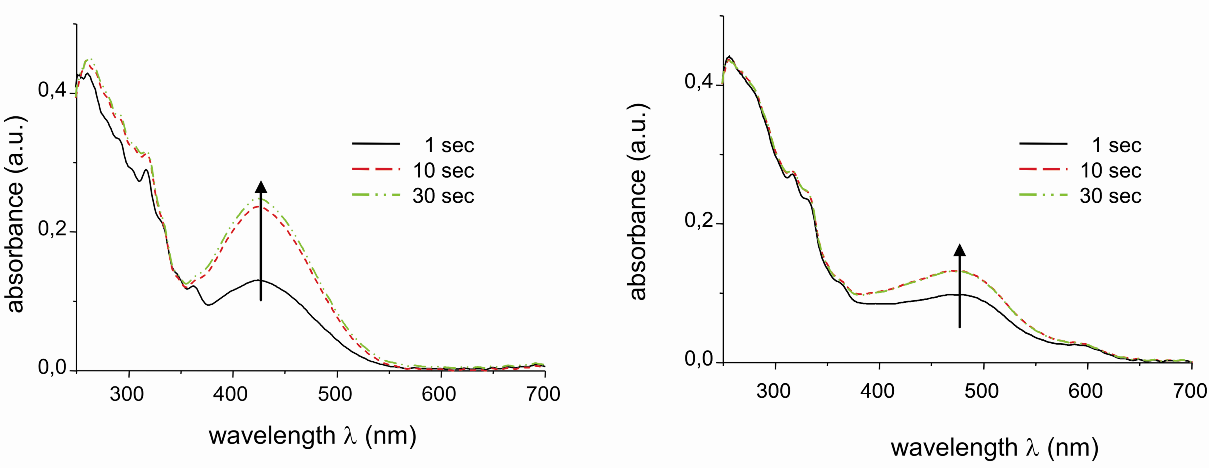
(■ experimental data, — fit)

containing **2** (■ experimental data, — fit)

UV/Vis-absorpion spectra of polyethylene films doped with dye-loaded alumosilica particles



UV/Vis induced spectral evolution of PE films doped with MCM 41S containing **1** (left) and MCM 41S containing **2** (right) upon irradiation with a Xenon lamp (290 to 900 nm).



UV/Vis induced spectral evolution of PE films doped with MCM 48S containing **1** (left) and MCM 48S containing **2** (right) upon irradiation with a Xenon lamp (290 to 900 nm).