

Cationic Polyhedral Oligomeric Silsesquioxane (POSS[†]) units as carriers for drug delivery processes

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Supplementary Information

Preparation of Cos-1 cells:

Cell culture: Cos-1 cells were grown and maintained in Dulbecco's Modified Eagle Medium supplemented with L-glutamine, fetal bovine serum, and gentamicin (all purchased from Gibco). Tissue culture plated was purchased from Costar. Cos-1 cells purchased from ATCC. Sodium phosphate was purchased from EM. Trypsin was purchased from Gibco.

Confocal Microscopy studies. Confocal images were acquired with a Zeiss LSM 510 Meta Confocal System with a transmission detector channel, using a Plan-Apochromat 63x/ oil DIC objective. Bodipy was excited using an argon laser (488 nm) through a 92 μ m pinhole. BODIPY emission was captured using a BP 505-530 filter. All confocal images were taken of live cells in supplemented media.

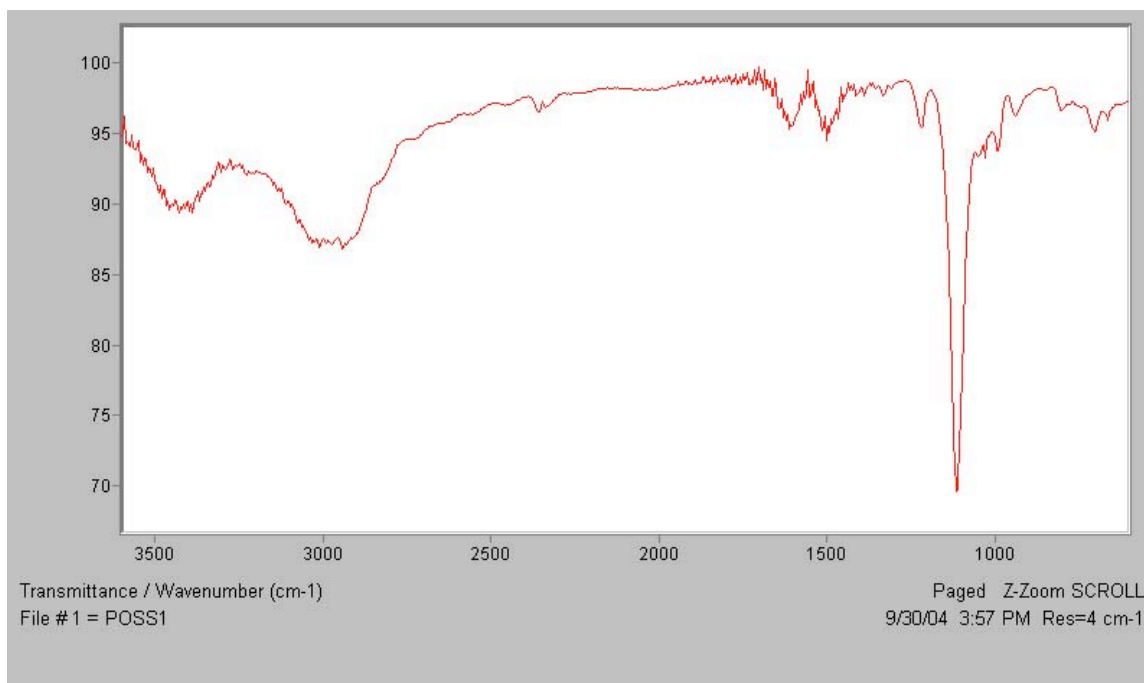
Cos-1 Viability assay. Cos-1 cells were split to approximately 80% confluency in a 96-well culture plate the day preceding the assay. Cells were incubated at 37°C in 7.5% CO₂ for two or 36 hours with 0.05, 0.1, 0.25, 0.5, or 1 mM OctaAmmonium-POSS®. Positive controls contained no POSS. Following the incubation periods, the media was aspirated from the well, cells were washed 2x with PBS, and fresh media was added. Following the MTT kit protocol (purchased from Chemicon International), viability was measured by enzymatic reduction of the yellow tetrazolium MTT to a purple formazan, as measured using an EL808IU microplate reader (Biotek Instruments, Inc.) for absorbance readings. General procedure for the synthesis of POSS-BODIPY:

Materials and General Methods. OctaAmmonium-POSS® was purchased from Hybrid Plastics, Inc. All other chemicals were reagent grade, and were used without further purification. All reactions were performed under inert atmosphere (Ar).

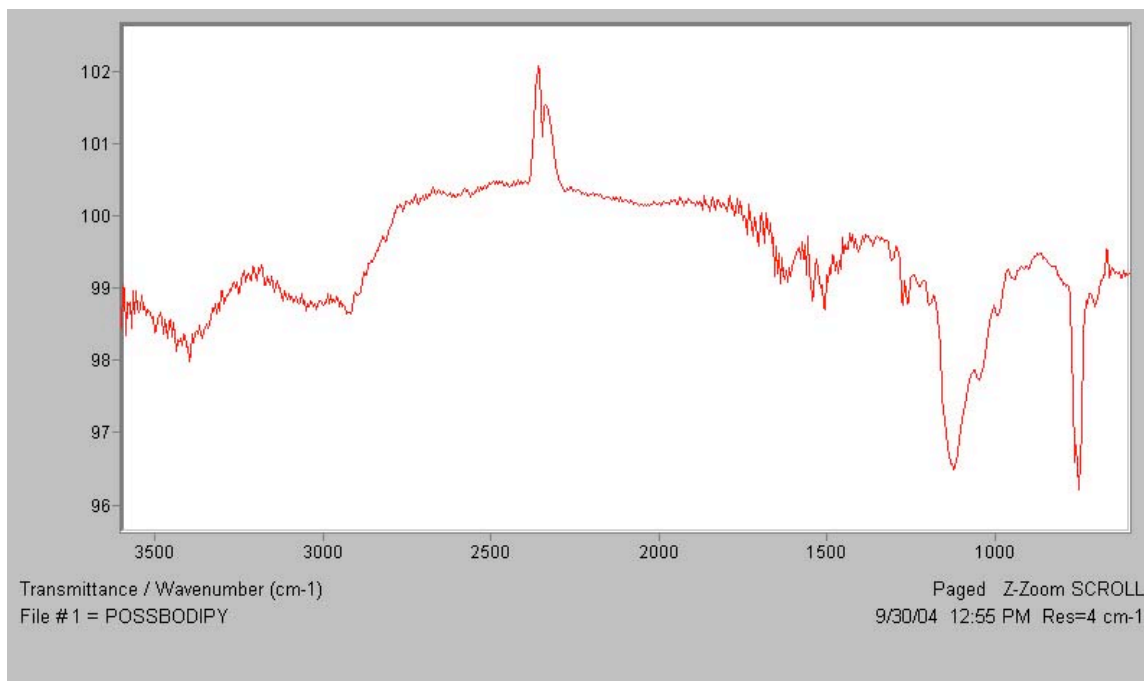
BODIPY labeled OctaAmmonium-POSS (POSS-BODIPY): To a solution of OctaAmmonium-POSS® (17 μ mol, 1 eq.) in a mixture of THF/MeOH (1:1) was added 1.7 μ l of pyridine (21 μ mol, 1.25 eq.). After 30 min. of stirring, BODIPY-succinidyl ester (17 μ mol, 0.125 eq.) was added to the solution. The reaction was allowed to stir for 6h. and then extracted with H₂O and CH₂Cl₂. The extracted aqueous layer was then placed on a lyophilizer and allowed to dry overnight, yielding ~20 mg of product (12.7 μ mol). The dried product was then characterized using Thin Layer Chromatography (TLC). TLC of the crude **POSS-BODIPY** was found to be highly fluorescent and showed no remnants of BODIPY-succinidyl ester starting material (1:1 THF/ CH₂Cl₂ mix).

Succinidyl ester boron dipyrromethene (succinidyl ester BODIPY): For the synthesis of succinidyl ester BODIPY, synthesis analogous to synthesis of **control amine terminated BODIPY**: Drechsler, U.; Thibault, R. J.; Rotello, V. M.; *Macromolecules*; (Communication); **2002**; 35(26); 9621-9623.

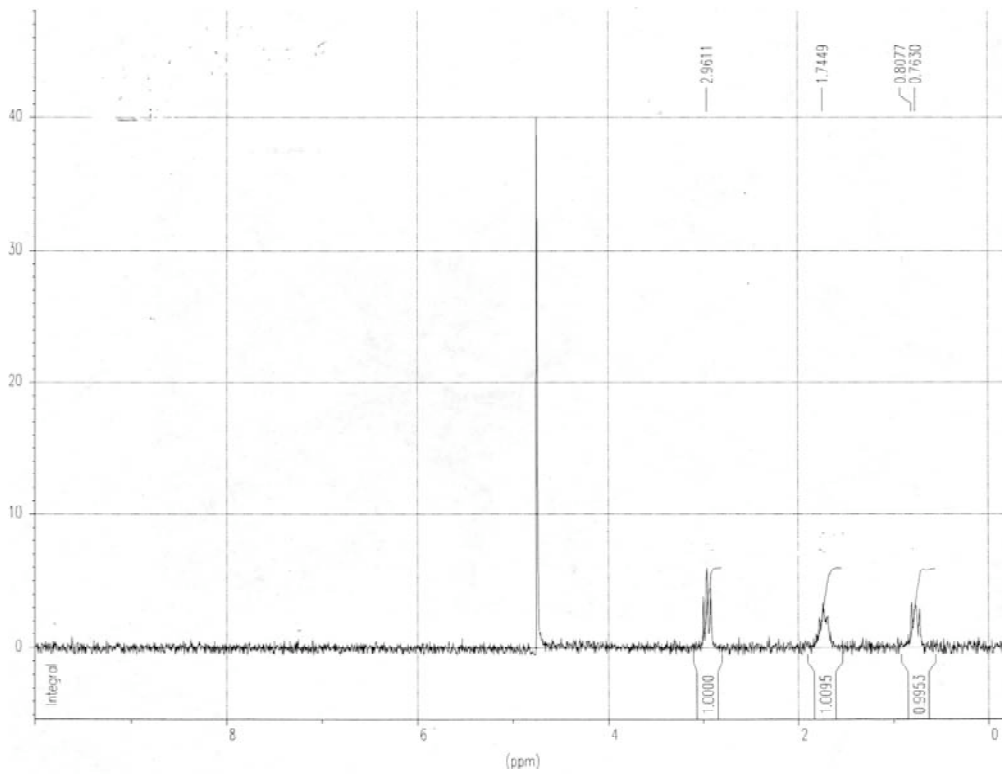
Amine functionalized boron dipyrromethene (control amine terminated BODIPY): For the synthesis of control amine-BODIPY please refer to: Drechsler, U.; Thibault, R. J.; Rotello, V. M.; *Macromolecules*; **2002**, *35*, 9621-9623.



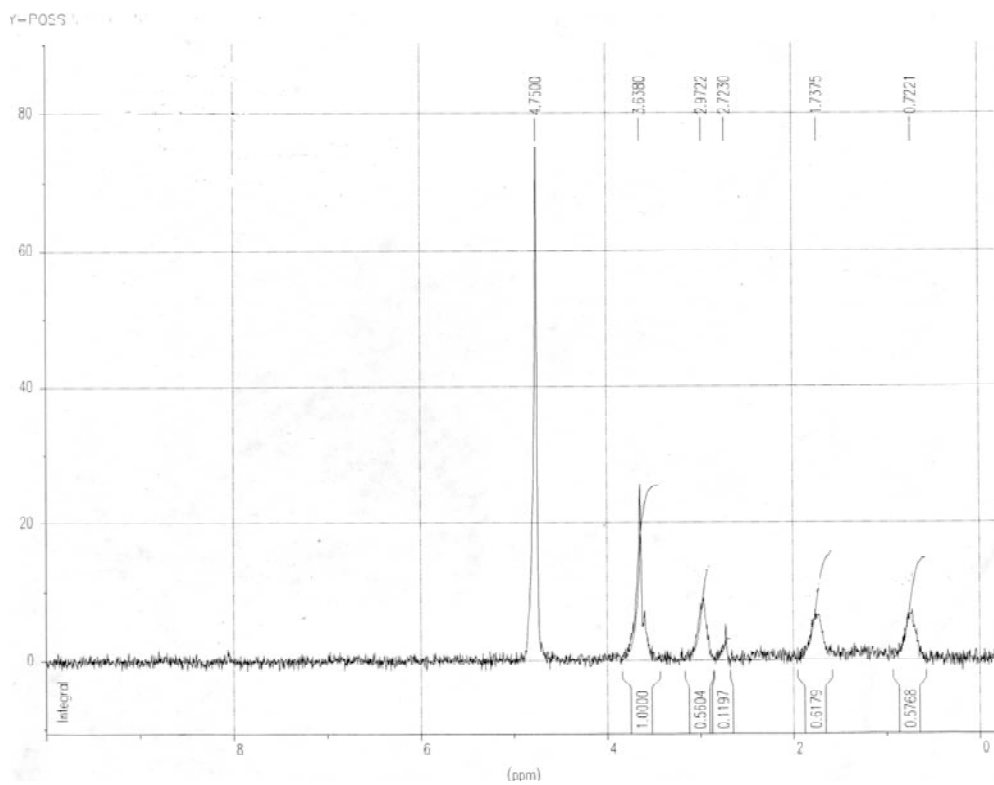
IR spectra of OctaAmmonium-POSS@:



IR spectra of **POSS-BODIPY**



¹H NMR spectra of OctaAmmonium-POSS@:



¹H NMR spectra of **POSS-BODIPY**: