Electronic Supplementary Material (ESI) for RSC Advances.

Cationic imidazolium polymer monoliths for efficient solvent exchange, activation and fluorination on a continuous flow system

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Supporting Information

Grafting of the glass channels of the microfluidic chip

Glass microfluidic chip was functionalized with methacryloxypropyltrimethoxysilane following a literature report.[1] The siloxly ether groups on the glass surface was first hydrolyzed to activate the glass surface by flowing NaOH (1 M,1 mL) through an empty microfluidic chip at 1ml/hr for 30 minutes. The microfluidic channel was then washed with water followed by HCl (1M, 1 mL) to neutralize the residual NaOH on the glass surface. The chip was finally washed with water (0.5 mL) and ethanol (0.5 mL). The activated microfluidic chip was dried in a vacuum oven overnight at 80°C. The channels were then incubated with the methacryloxypropyltrimethoxysilane (0.31 g, 1.3 mM, 0.3 mL) solution in acetone (3:7 v/v) in dark at room temperature overnight. The excess alkoxysilane reagent was washed with acetone and then air dried. The functionalized glass chip was kept in the dark at 2-8 °C.

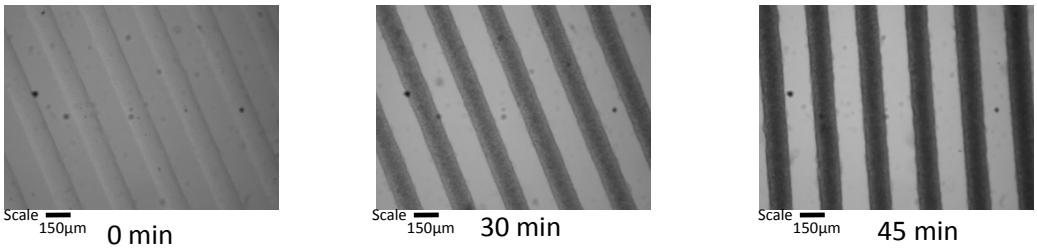

Fig. S-1: Optical images of the UV-polymerization of vinylbenzylchloride and divinylbenzene within the glass microfluidic chip at different times.

UV-photografting of the inner surface of ETFE tubing

Benzophenone (0.25 g, 1.4 mM) and EDMA (0.1 g; 0.5 mmoles; 95 µL) was dissolved in 5 mL of acetone to achieve a final concentration of 0.1 M of ethylene dimethacrylate (EDMA) and 5% of benzophenone in acetone according to a modified literature report.[2] The reaction mixture was sonicated in a Schintilation vial for ~ 5 minutes. The degassed mixture was immediately charged into a 1/16 inch OD ETFE (ID 400µm) tubing using a syringe and capped. The tubing was placed inside the UV spectrolinker equipped with a 254 nm lamp at 504 mJ/m^2 for 20 min. After the initial photografting step, the tubing was washed with ~ 1 mL of acetone and briefly dried with air.

The pore size of the vinylbenzyl chloride polymer monolith ranged from 1115 µm to 0.0036 µm with while the average pore size was 0.2490 µm. The surface area of the polymer monolith was determined by BET analysis using nitrogen gas and found to be 1.047m^2/g.

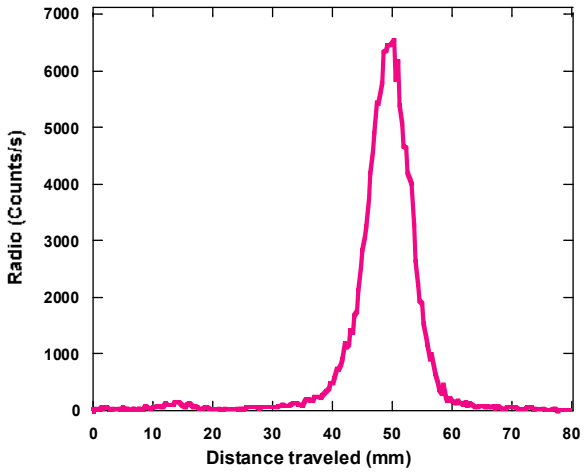

Fig. S-3: Representative radio-TLC of the 4-fluoroethylbenzoate. The TLC plate was developed in a mixture of hexane/ethyl acetate (1:1 v/v).

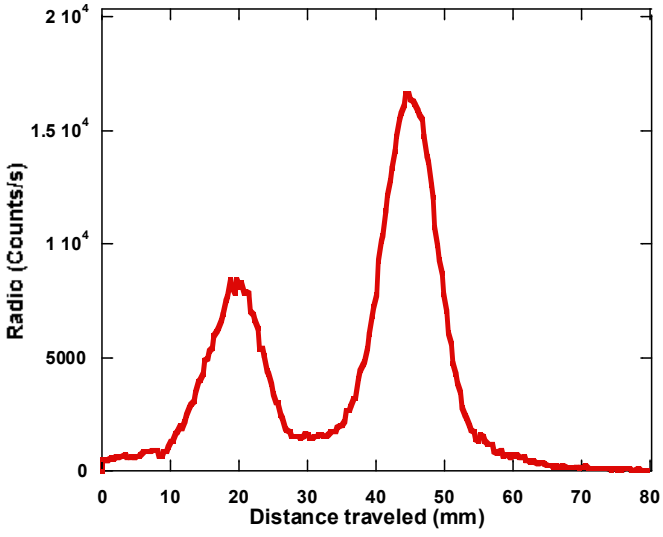

Fig. S-4: Representative radio-TLC of the [^{18}F]fallypride. The TLC plate was developed in a mixture of methanol/ethyl acetate (1:1 v/v) and 1% of triethylamine.

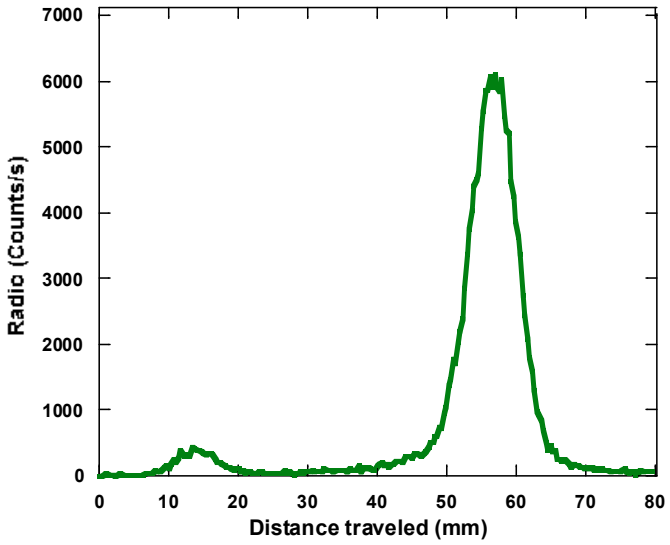

Fig. S-5: Representative radio-TLC of the protected [^{18}F]FDG intermediate. The TLC plate was developed in a mixture of acetonitrile/water (95:5 v/v).

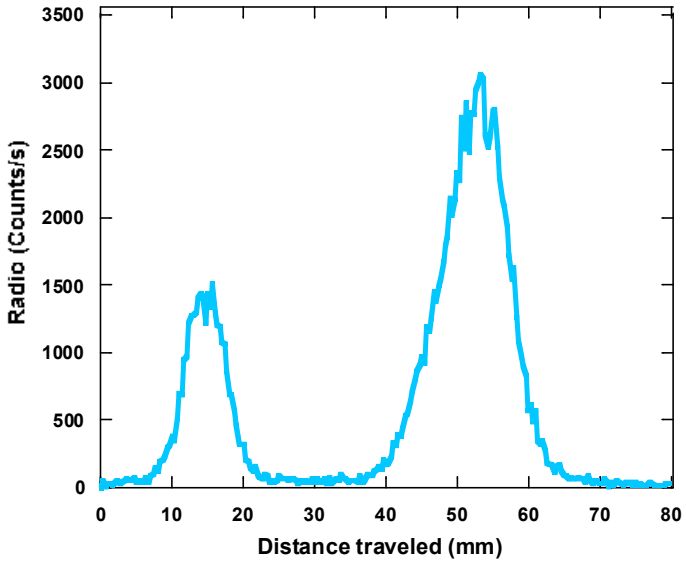

Fig. S-6: Representative radio-TLC of the protected [^{18}F]FLT intermediate. The TLC plate was developed in a mixture of acetonitrile/water (95:5 v/v).

References:

1. J. Vidič, A. Podgornik, and A. Štrancar, *J. Chromatogr. A*, 2005, **1065**, 51–58.
2. D. Connolly and B. Paull, *J. Sep. Sci.*, 2009, **32**, 2653–2658.