Supporting Information

Simultaneous spray coating of interacting species : General rules governing the system poly(styrene sulfonate)/poly(allyl amine)

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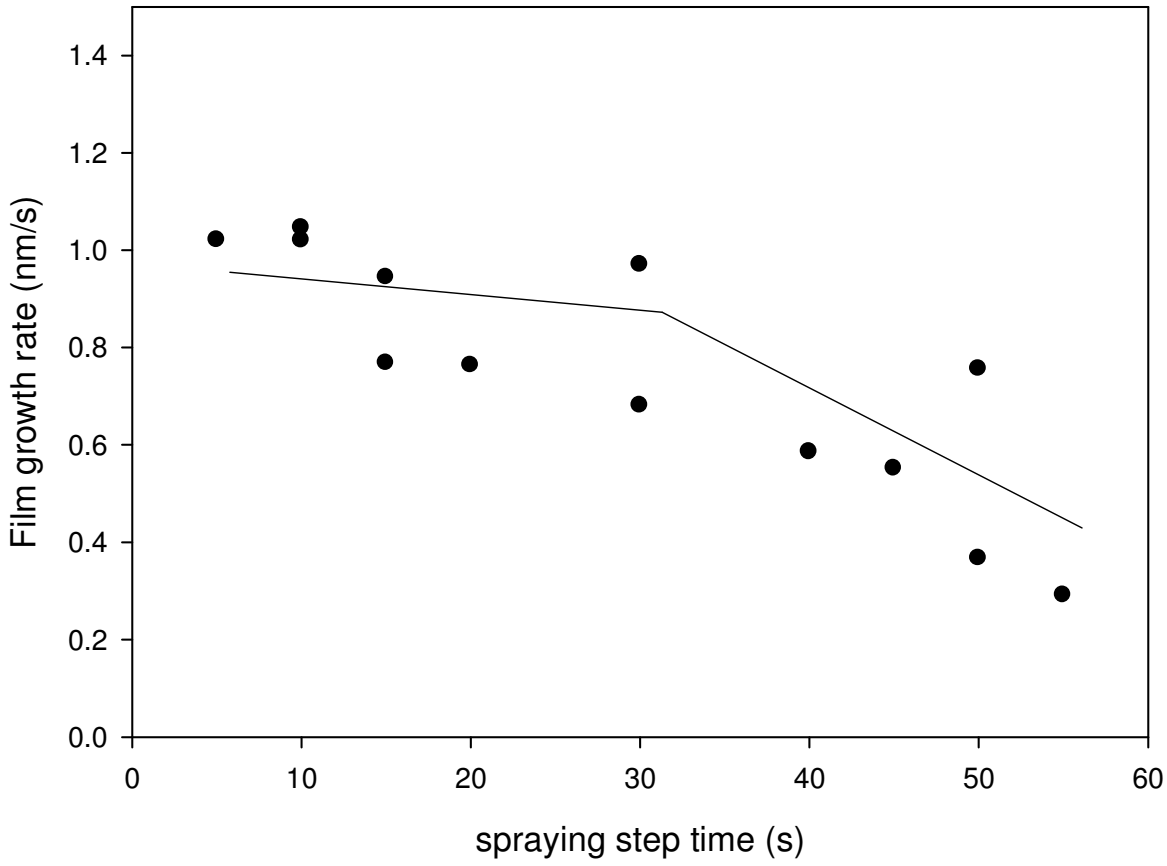
Figure S 1: Variation of the growth speed of a PAH/PSS film sprayed simultaneously versus the spraying step duration.

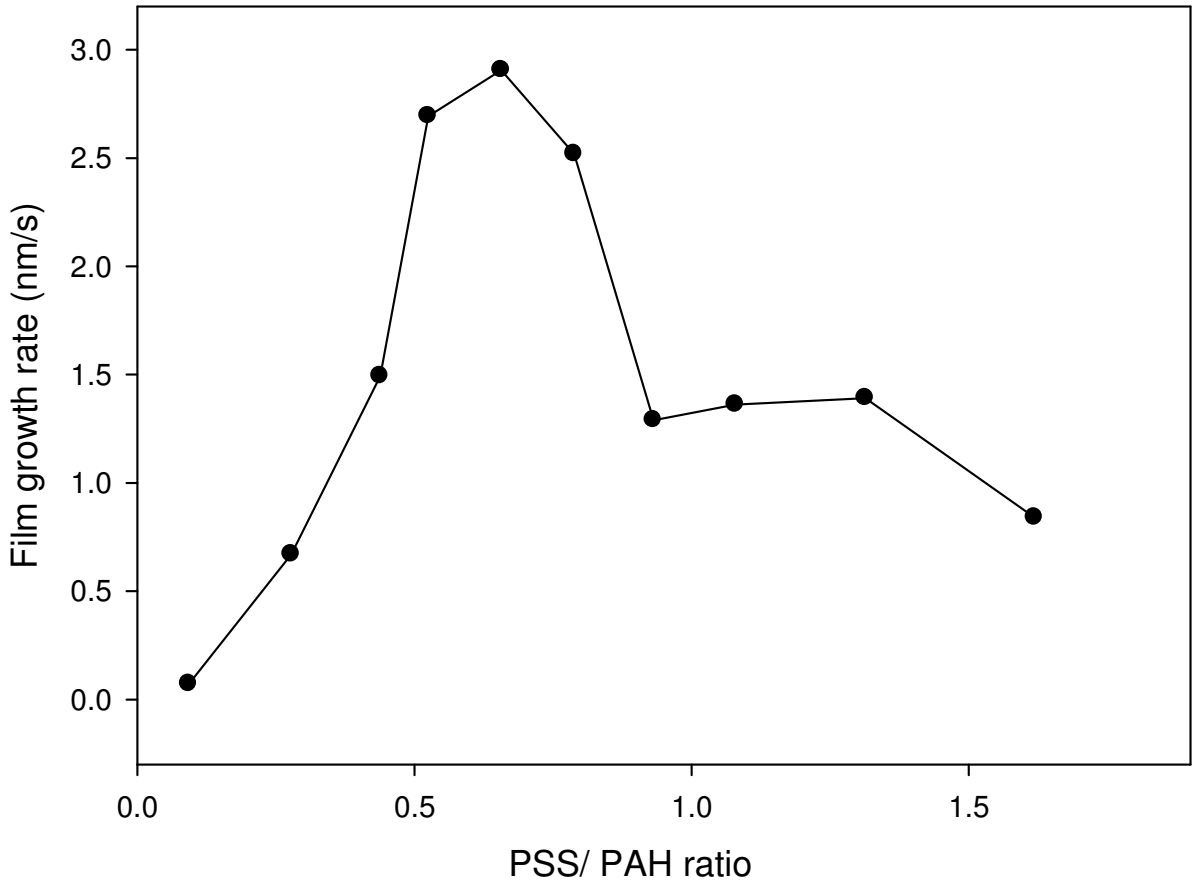
Figure S 2: Variation of the growth speed of a PAH/PSS film sprayed simultaneously versus PSS/PAH ratio with different flow rates.

Figure S 3: AFM pictures showing the changes in the morphology of a PAH/PSS film sprayed simultaneously versus the PSS/PAH spraying rate ratio.

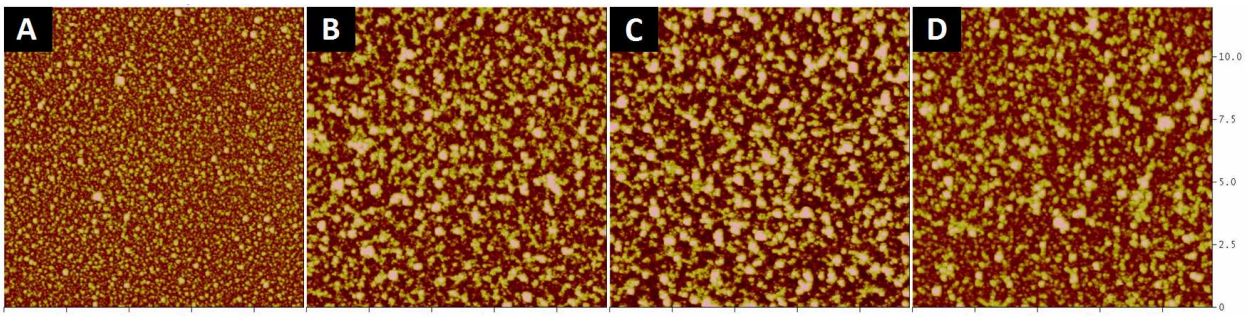
Figure S 4: XPS spectrum obtained from a PAH/PSS film sprayed simultaneously



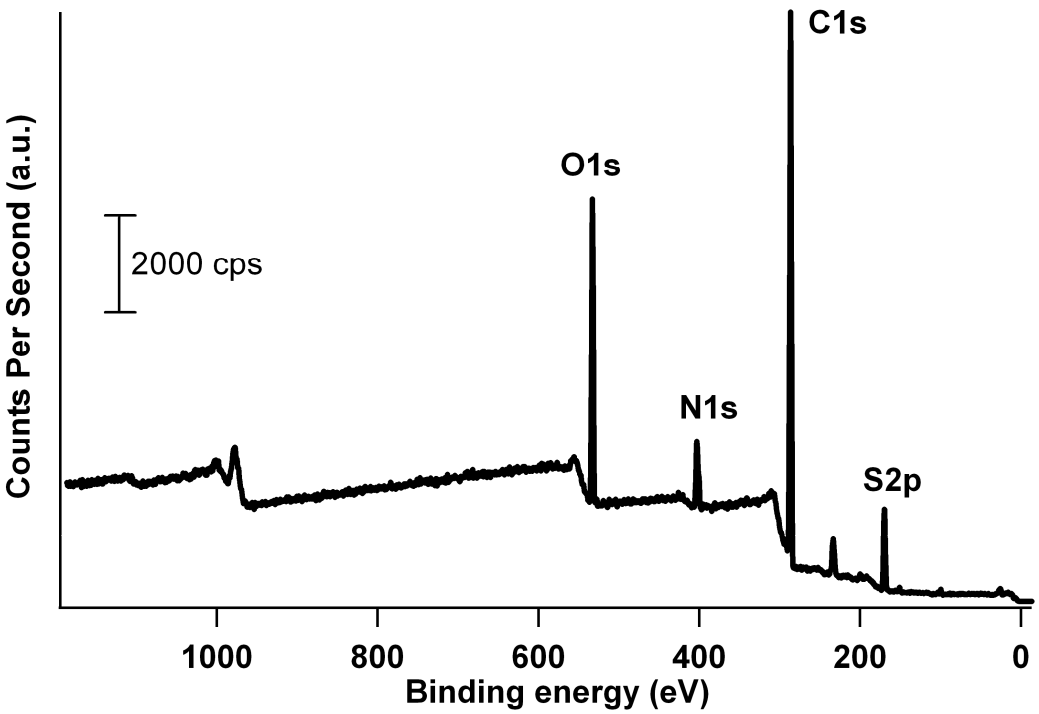
S1 : Evolution of the film growth rate versus the varying spraying step time. Poly(allylamine hydrochloride) (PAH) solution of 0.5 mg.mL^{-1}, sprayed at a spraying rate of $1.5\text{x}10^{-3} \pm 1.4\text{x}10^{-4}$ mol/s, poly(styrene sulfonate) (PSS) solution of 0.5 mg.mL^{-1}, sprayed at a spraying rate of $8.0\text{x}10^{-4} \pm 1{,}7.10^{-5}$ mol.s^{-1} . It corresponds to a PSS/PAH ratio of 0.54±0.05



S2 : Film growth rate (in nm/s) versus poly(allylamine hydrochloride) / poly(styrene sulfonate) ratio for PAH spraying rate constant of 2.3×10^{-3} $mol.s^{-1}$ (PAH concentration of 0.5 mg/mL) and PAH flow rate of 24.2±1 $mL.s^{-1}$ and PSS spraying rate variable and PSS flow rate of 15.2±0.5 $mL.s^{-1}$. The solutions were at pH 7.5 and sprayed with a duration of a (single) spraying step of 5 seconds.



S3 : Evolution of the film morphology with the PSS/PAH spraying rate ratio. The overall morphology of the film does not change with the spraying ratio: one always obtains a granular structure. PSS/PAH (sprayed) ratio of respectively 0.15; 0.41; 0.82 and 1.15. AFM in contact mode, 12 µm X 12 µm, z-scale of 200 nm for A, B and C; 250 nm for D.



S4: Typical X-Ray Photoelectron Spectroscopy (XPS) spectrum of a PAH/PSS film. Poly(allylamine hydrochloride) concentration is 2.5 $mg.mL^{-1}$ (spraying rate of PAH of $5x10^{-3}$ $mol.s^{-1}$) and poly(styrene sulfonate) concentration is 3 $mg.mL^{-1}$ (spraying rate of PSS of $7.6x10^{-3}$ $mol.s^{-1}$) corresponding to a PSS/PAH (sprayed) ratio of 0.66.