

## Supporting Information

### Controlled Growth of Polyaniline Fractals on HOPG through Potentiodynamic Electropolymerization

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Index:

SI Figure 1: Determination of surface coverage of the PANI fractals obtained by potentiodynamic electropolymerization for 32 min.

SI Figure 2: Determination of surface coverage of the PANI fractals obtained by potentiodynamic electropolymerization for 42.6 min.

SI Figure 3: Determination of surface coverage of the PANI fractals obtained by potentiodynamic electropolymerization for 53 min.

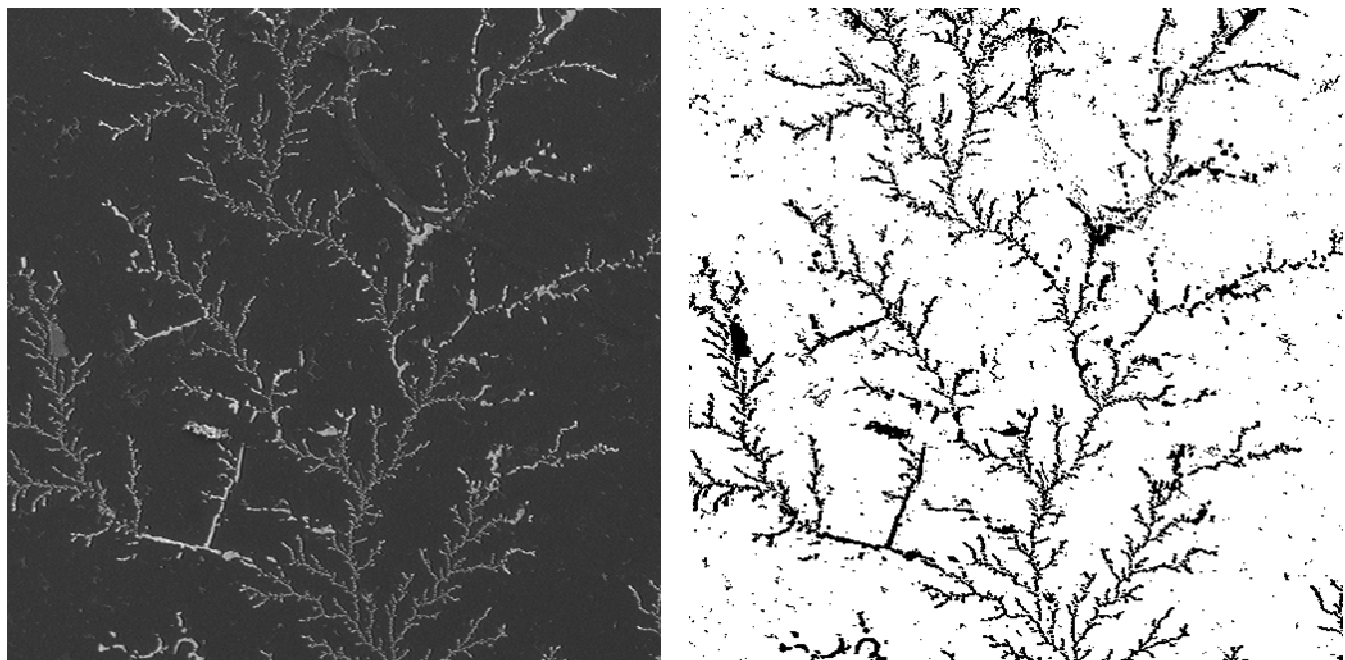
SI Figure 4: Determination of surface coverage of the PANI fractals obtained by potentiodynamic electropolymerization for 64 min.

SI Figure 5: Determination of fractal dimension of PANI obtained by 53 min. of electropolymerization on HOPG by chronoamperometric method.

SI Figure 6: SEM micrograph of the PANI fractals formed on HOPG by potentiodynamic polymerization at a sweep rate of (a) 10 and (b) 15 mVs<sup>-1</sup>.

SI Figure 7: The dependence of electrodeposited PANI morphology on the nature of the surface of (a) HOPG and (b) Au (111).

SI Figure 8: The termination of the PANI fractals at the edges and formation of bare location on HOPG.

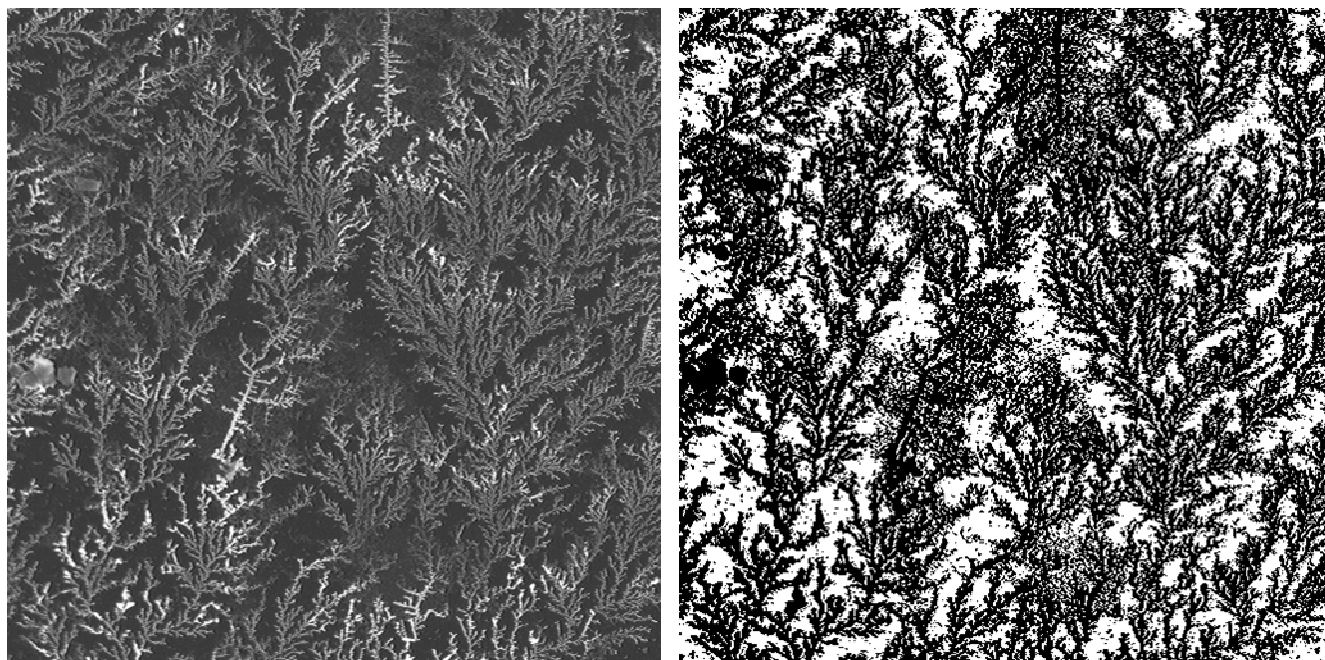


SI Figure 1: Calculation of surface coverage for the fractal surface obtained by electropolymerization for 32 min.

Grey scale: 8 bit; Total Pixels: 262144; Black Pixels: 3384; White Pixels: 230760

Pixel Area =  $0.23 \times 0.23$  sq. $\mu\text{m}$ ; Field of View Area = 13867.41 sq. $\mu\text{m}$

Black area (area occupied by fractal) = 179.01 sq. $\mu\text{m}$ ; % coverage = 12.9.

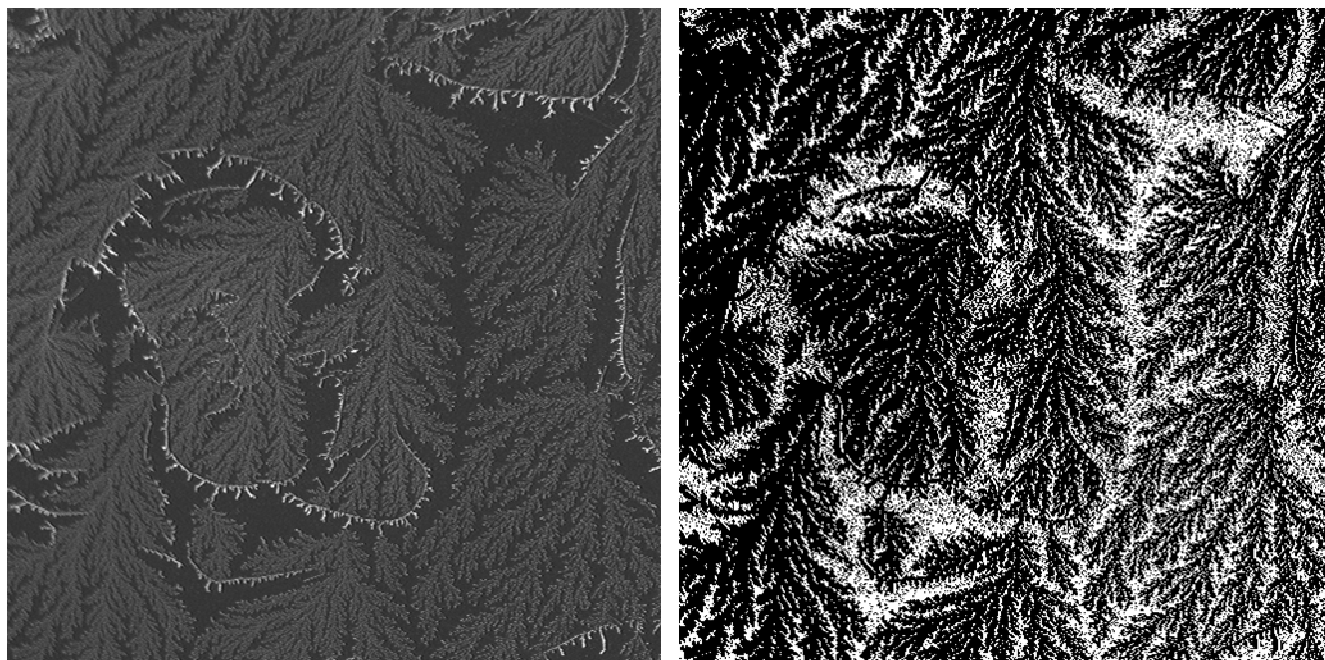


SI Figure 2: Calculation of surface coverage for the fractal surface obtained by electropolymerization for 42.6 min.

Grey scale: 8 bit; Total Pixels: 262144; Black Pixels: 159663; White Pixels: 102481

Pixel Area =  $0.69 \times 0.69 \text{ sq.}\mu\text{m}$ ; Field of View Area =  $124806.75 \text{ sq.}\mu\text{m}$

Black area (area occupied by fractal) =  $76015.55 \text{ sq.}\mu\text{m}$ ; % coverage = 60.9.

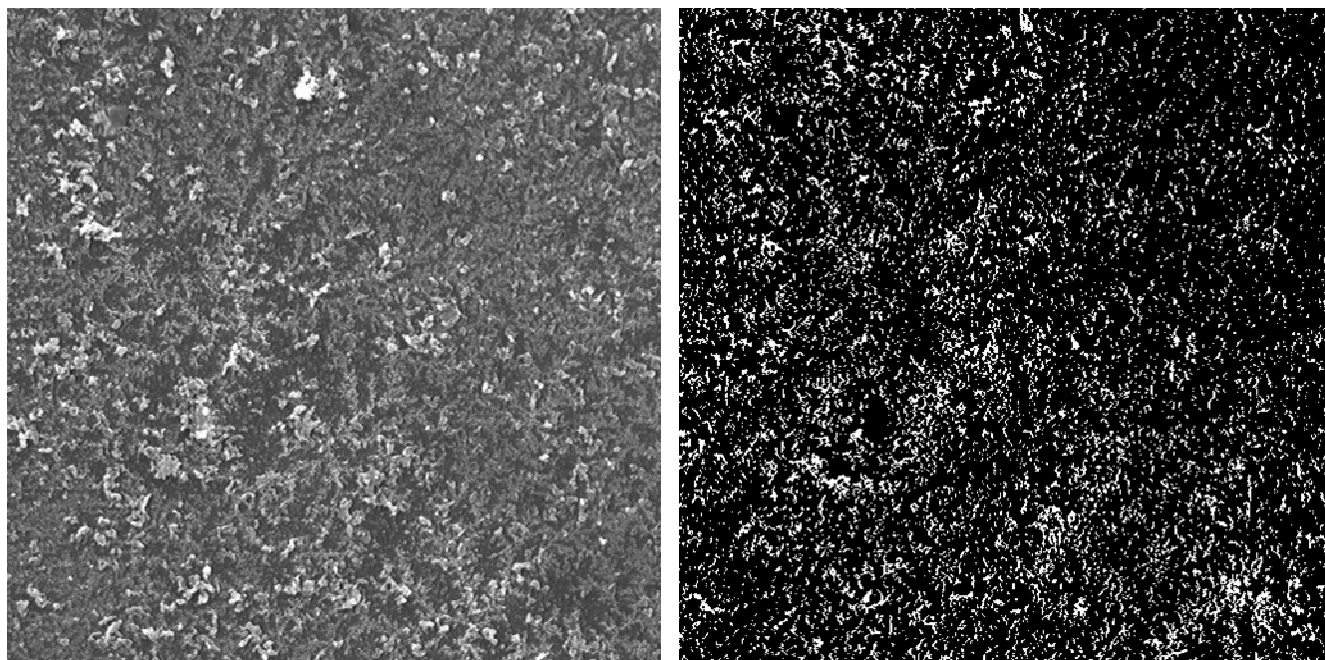


SI Figure 3: Calculation of surface coverage for the fractal surface obtained by electropolymerization for 53 min.

Grey scale: 8 bit; Total Pixels: 262144; Black Pixels: 190941; White Pixels: 71203

Pixel Area =  $1.4 \times 1.4$  sq. $\mu\text{m}$ ; Field of View Area = 51380.24 sq. $\mu\text{m}$

Black area (area occupied by fractal) = 374244.36 sq. $\mu\text{m}$ ; % coverage = 72.8.

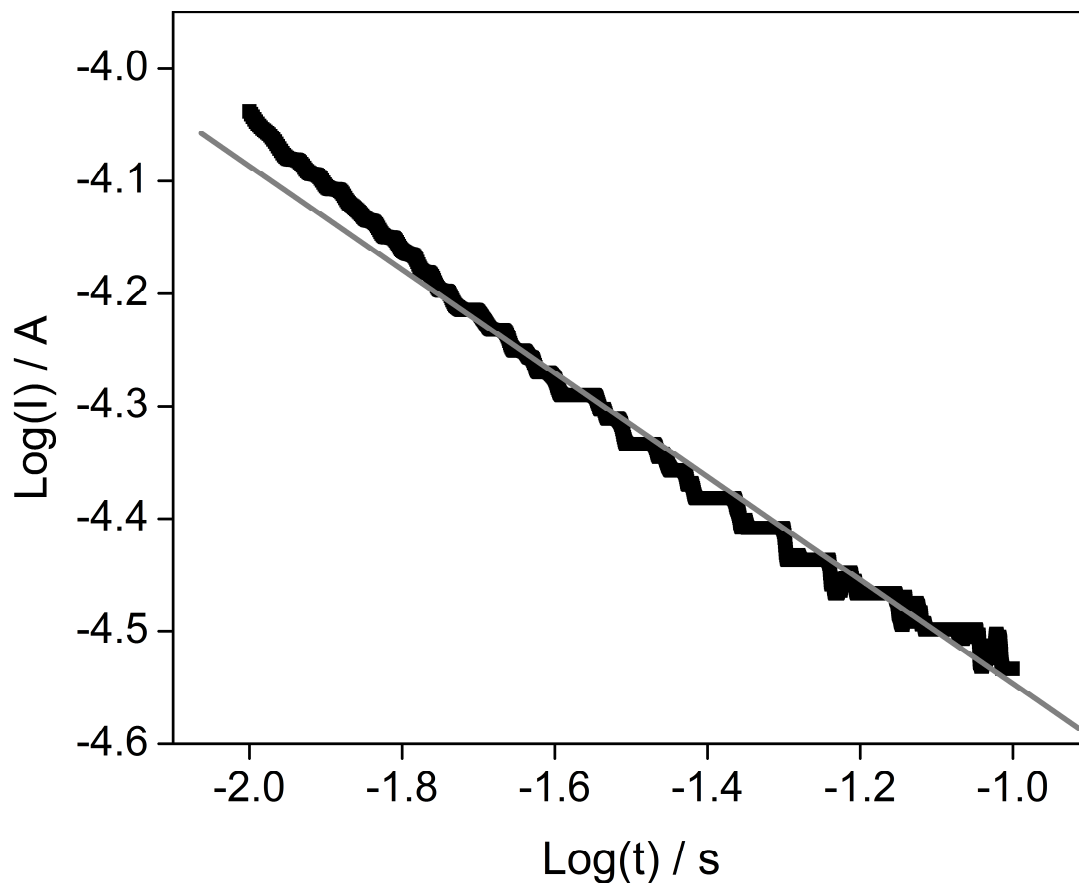


SI Figure 4: Calculation of surface coverage for the fractal surface obtained by electropolymerization for 53 min.

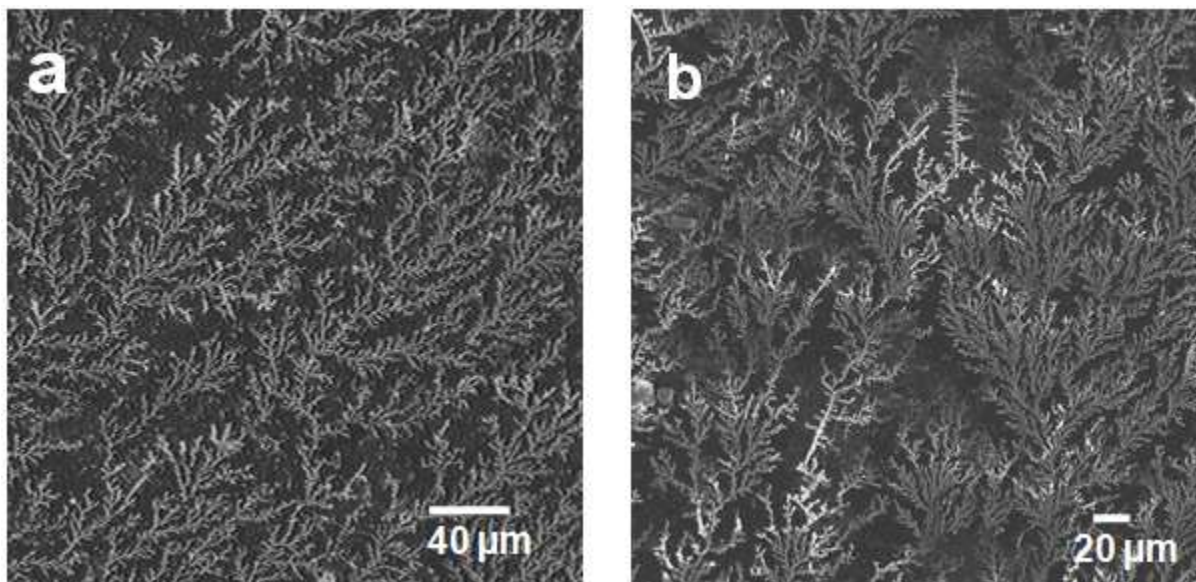
Grey scale: 8 bit; Total Pixels: 262144; Black Pixels: 229193; White Pixels: 32951

Pixel Area =  $0.24 \times 0.24$  sq. $\mu\text{m}$ ; Field of View Area = 15099.49 sq. $\mu\text{m}$

Black area (area occupied by fractal) = 13201.52 sq. $\mu\text{m}$ ; % coverage = 87.4.

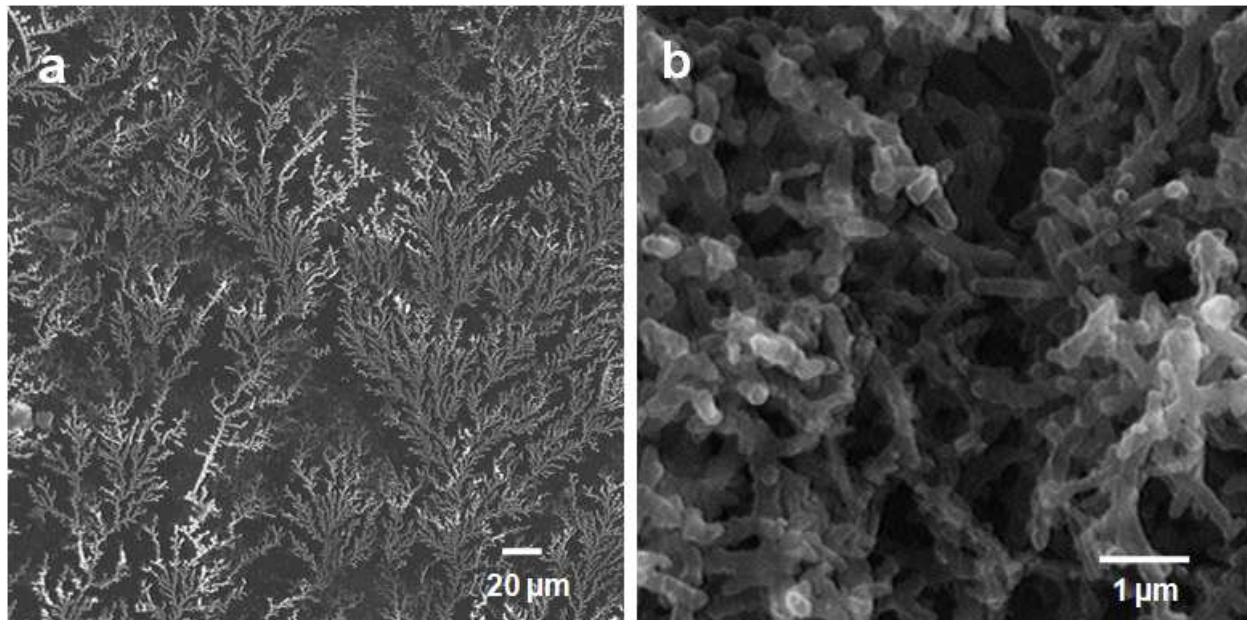


SI Figure 5: Determination of fractal dimension of PANI obtained by potentiodynamic polymerization of 53 min. from the slope of the current-time relationship plotted in a log-log scale in a certain time domain where current varies as power law of time.

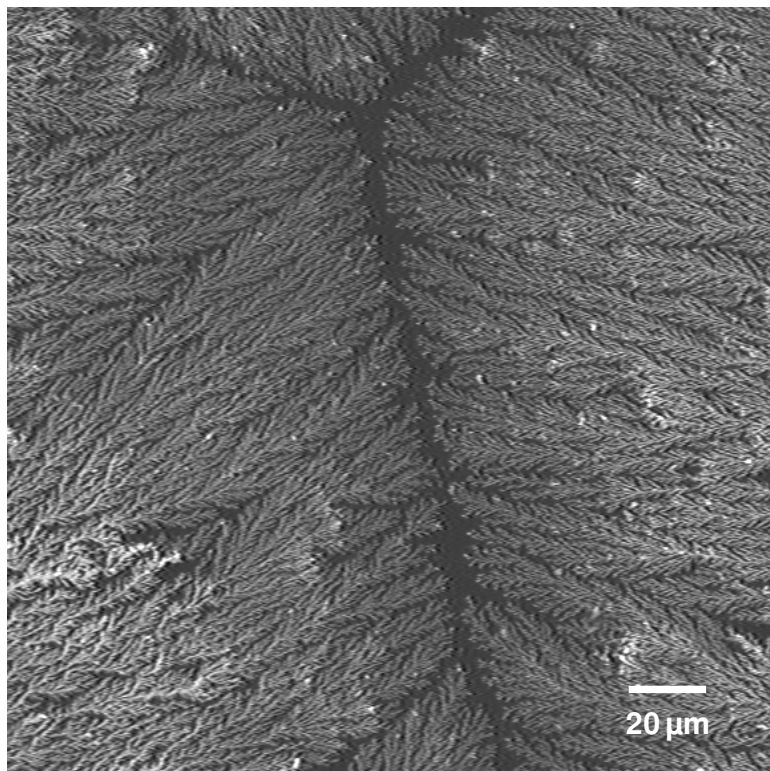


SI Figure 6: The nature of PANI fractals obtained under potentiodynamic conditions when the sweep rate was restricted to (a) 10 and (b) 15  $\text{mVs}^{-1}$ . The surface coverage and lateral growth of the fractals are found to be lower at low sweep rate.





SI Figure 7: (a) The diffuse limited polymerization lead to produce dendrimeric fractals of PANI on HOPG surface whereas (b) under identical conditions of electropolymerization only tubular bush of PANI is formed on Au (111) surface.



SI Figure 8: The SEM image of PANI fractal showing the termination of fractal domains and creation of no deposition zone amongst various domains.