



Different patterns during particle growth process in an rf discharge dusty plasma system

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Dust particles were obtained through the discharge of mixture gases of silane, argon and ethylene in an radio frequency (rf) discharge dusty plasma system. The dust particles can form different patterns during the dust growth process from small to large sizes. The growth of dust particles can be divided into spherical growth and fractal growth according to the way of growth. The effects of different experimental parameters including gas pressure, radio frequency power and gas ratio, etc. on dust growth and dust patterns are investigated. In order to

investigate the formation mechanisms of dust patterns and dust particles with different sizes and shapes, molecular dynamics (MD) simulations are also used to investigate the influence of different factors on dust growth, the system structures and properties separately. Some simulation results are qualitatively consistent with our experimental phenomena and can provide a guide for the study on dust growth and dust patterns.

Key words: dust growth, dust patterns, dusty plasmas