Evaluation of Adsorption Capability of Heavy Metal Cations on Various Nanostructured Graphitic Carbon Nitrides

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Removing heavy metals from drinking water has been considered as one of the important issues among environmental problems due to the direct effect on our health.
Thermal polycondensation of nitrogen rich organic monomers like cyanamide and dicyandiamide easily derives graphitic carbon nitrides (g-C3N4) whose graphitic planes are consisted of tri-s-triazine linked by trigonal nitrogen in proper stacking graphitic fashion. g-C3N4 has densely terminated surface amino groups as its intrinsic functionalities, which make them attractive adsorbent for heavy metal cations. Moreover, introducing various morphologies, i.e. hollow sphere, 2D hexagonal and 3D cubic symmetry is easily obtainable by nanocasting approach.
Herein, we examined the adsorption capability of various g-C3N4s depending on its structure, pH, reaction time and initial concentration of heavy metal cations. It was also analogically studied that the surface modification with other functionalities like thiol can enhance the selectivity of specific metal cations which is not available by original g-C3N4.