Adsorption and desorption study for selective recovery of silver ion using nanostructured graphitic carbon nitride (g-C3N4)

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Selective recovery of noble metal ions in aqueous phase is required to develop environmental friendly and cost effective process. Among various separation processes, adsorption with proper adsorbents is easy to utilize, simple, cheap, and highly effective method. Herein, we demonstrated selective recovery of silver ions which have various catalytic activities using nanostructured g-C3N4. g-C3N4 is consisted with carbon and nitrogen molecules stacking in graphitic fashion. The lone pair electrons on nitrogen atoms can act as active binding sites to adsorb silver ions without any further surface modifications. Also large surface area of nanostructured g-C3N4 takes advantages to have chance to adsorb silver ions. To verify adsorption capacity of silver ion onto nanostructured g-C3N4, we figured out silver ions adsorption capacity of nanostructured g-C3N4, desorption and reusability. Moreover adsorption kinetics, heat of adsorption and selective adsorption of silver ions from various metal ions solution were also studied.