from water samples using ethylenediamine-N,N-diacetic acid (EDDA) bonded on silica-coated magnetite nanoparticles (MNPs) and its determination by flame atomic absorption spectrometry (FAAS) after eluting with 0.5 mol L^{-1} $Na_2S_2O_3$. The nanoparticles were characterized by XRD, VSM, SEM and FT-IR spectroscopy. This new bonded silica gel was used as an effective sorbent for the solid-phase extraction (SPE) of Ag(I) ions from aqueous solutions [1]. To obtain the most suitable data from this method, factors influencing the sorption and desorption of silver ions such as: pH, sample volume, eluent concentration and volume, and co-existing ions have been studied and established. Sodium thiosulfate solution could efficiently elute the absorbed Ag(I) ions from the surface of the sorbent. The sorbent exhibited excellent stability [2]. The effect of coexisting ions in binary mixtures, containing Ag(I) ions and the foreign ion, on percent recovery of silver ions was investigated. Mercury(II) ions showed interfering effect and this effect of Hg^{2+} was eliminated by adding EDTA to the sample solutions [3]. Under the optimal experimental conditions, preconcentration factor, detection limit and relative standard deviation were 150 (for 600 mL of sample solution), 0.06 μg mL^{-1} and 3.2% (5.0 μg mL^{-1}; n=10), respectively. The proposed method was successfully applied to the separation/preconcentration and determination speciation of Ag(I) ions in different real samples and suitable recoveries were obtained.

References

[1] T. Madrakian, A. Afkhami, M.A. Zolfigol, M. Solgi, J. Hazard. Mater. B128 (2006) 67–72.
[2] A. Safavi, N. Iranpoor, N. Saghir, Sep. Purif. Technol. 40 (2004) 303–308.
[3] M. Akhond, G. Absalan, L. Sheikhian, M.M. Eskandari, H. Sharghi, Sep. Purif. Technol. 52 (2006) 53–59.

Detection devices for explosives in environments: A review

E. Fatehyan, F.Dolati, T. Heidari*

Department of Chemistry, Faculty of Sciences, Ferdowsi University of Mashhad, Iran

In recent years, as a whole the international situation is stable, whereas local war still going on. Since the terrible incident taking place in America on September 11, 2001, necessary measures have been taken in various countries, in order to cope with the terrorism. Bag gages should be checked in the frontier inspection station and the airport, so as to make sure whether there are explosives or not. Anyway, explosives are dangerous and their usage ought to be restricted. Therefore, the job of detecting explosives is important and necessary during the security inspection [1]. The terrorist attacks around the world have brought a new focus onto the identification and quantization of explosive residues in crime scene investigation and homeland security.Recently, Explosive-based terrorism has grown enormously, because explosive-based weapons are deploy, and can cause enormous damage [2]. Attack on commercial aviation was regarded as unthinkable until the 1960s. One of the front liness of homeland security, airport departure gates, uses sophisticated screening devices such as Ion mobility spectrometers that have become prominent trace detectors of explosives and can be seen in airports worldwide at security check points where hand bags, and other small articles, to be carried onboard aircraft are screened for explosives[3]. Surfaces of such articles are wiped using a cloth strip to collect residues or particulates of explosives For the detection of traces of explosive substances in the air, issues related to the low vapor pressures of many explosives are only exacerbated further when these explosives are wrapped or packaged to avoid detection[4].We have within this reviewdifferent technique for achieving security inspection and illicit substance screening additional.We discussed many of the applications that require explosive detection and the capabilities of some of the current commercial systems.

References

[1] M. Marshall, in: M. Marshall, J.C. Oxley (Editors), Aspects of Explosives Detection, 2009, pp. 11-26
[2] S. Singh, J. Hazardous Materials 144 (2007) 15–28
[3] J. S. Caygill, F. Davis, P. J. Higson, Talanta 88 (2012) 14–29
[4] M. Pumera, j. Electrophoresis (2006), 27, 244–256

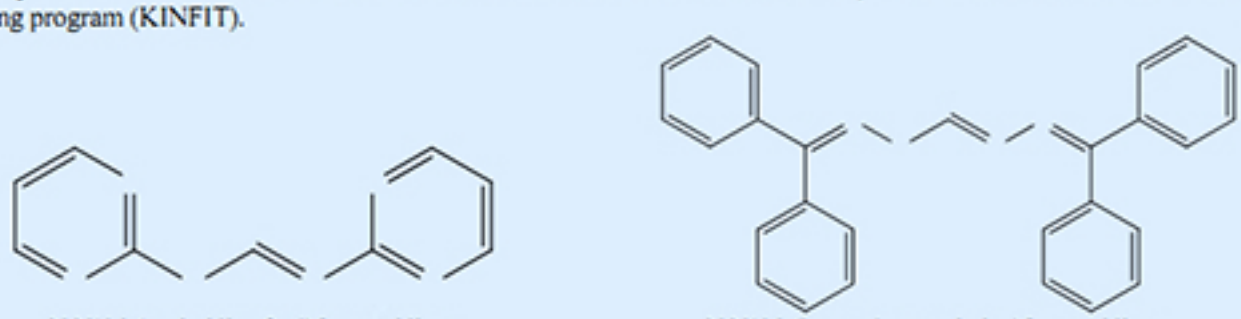
Synthesis and structural characterization of some new formamidine ligands and spectrophotometric study of some transition metal with these ligands

Mohammad Kazem Rofouei*, Akram Dadkhah

Faculty of Chemistry, Kharazmi University, Tehran, Iran
**Corresponding author. Tel.: +982188848949; fax: +98218820993.*
E-mail address: rofouei@tmu.ac.ir (M.K. Rofouei).
A_Dadkhahchem@yahoo.com

N-containing compounds such as amidines have been studied extensively because of their coordination chemistry and biological activity. Formamidines, a class of amidines, have applications in various fields. Their coordination chemistry has been investigated extensively during recent years. They can form bridges between metal atoms [1–2] and serve as multidentate ligands. Some other applications include as pharmacological agents such as pesticides (like amitraz) [3] and histamine receptor antagonists, as auxiliaries in asymmetric synthesis, protecting groups for primary amines, nitrogen-based nucleophiles, as building blocks in polymers and as support linkers in solid phase synthesis [4]. Spectrophotometric titrations are important methods for the investigation of solution equilibria. The titration consists of a collection of spectra of a solution measured as a function of the reagent added which influences the equilibrium under the investigation [5].

In this work we synthesized 2 new derivatives of formamidine (Figure. 1.) for first time and characterized them by FT-IR, FT-Raman, 1H NMR, 13C NMR spectroscopy and X-ray single crystal diffraction.Then their complexation with some transition metal were studied by spectroscopic titration. Also the effect of solvent on their complexation was investigated. The formulas and stability of complexes formed between metal ions and the ligand were determined spectrophotometrically by method of mole-ratio. For evaluation of the conditional formation constants, the mole ratio data obtained were fitted to a non-linear least squares curve fitting program (KINFIT).



N,N'-bis(pyrimidine-2-yl)formamidine N,N'-bis(benzophenone imine)formamidine

Fig.1: Structures of formamidines