Green chemistry: magnetic dispersive solid phase extraction for simultaneous enrichment and determination of V, Ni, Ti and Ga in water samples by HR-CS ETAAS.

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Supplementary material

Synthesis of M@GO-MTS

Previously, M@GO was synthetized as is described elsewhere [1-3] and after, M@GO was functionalized as follow: Initially, 0.35 g of M@GO is suspended in a solution comprising 60 mL of ethanol with 0.8% MTS. This suspension is subjected to reflux for a continuous period of 8 hours. The product is meticulously washed three times using methanol and subsequently dried at a temperature of 50°C. The molecular structure of the functionalized M@GO is visually presented in Figures SM1 and SM2. The final stage of functionalization is primarily attributed to the inherent propensity of the introduced functionalization group to undergo oxidation.

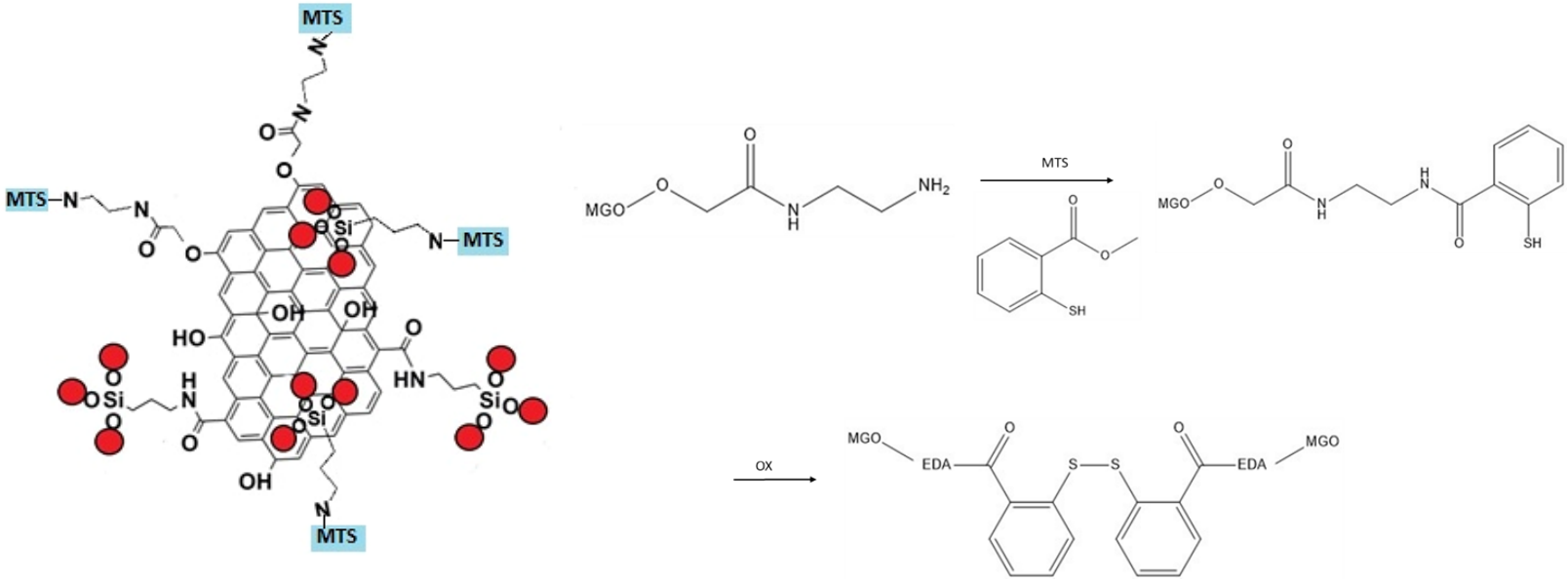

Figure SM1. Structure of functionalized M@GO.

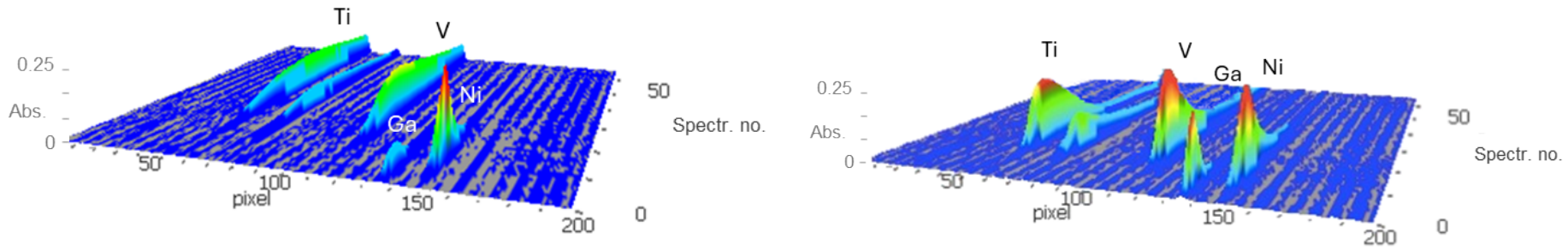

Fig. SM2. Time resolved absorbance spectra obtained by HR CS GFAAS measurement for 150.0 µg L^{-1} V, Ti, 300 µg L^{-1} Ni and 15 µg L^{-1} Ga (A) without Nb coating, spectral range between 294.1349 and 294.4999 nm; (B) with Nb coating, spectral range from 294.1349 and 294.4999 nm

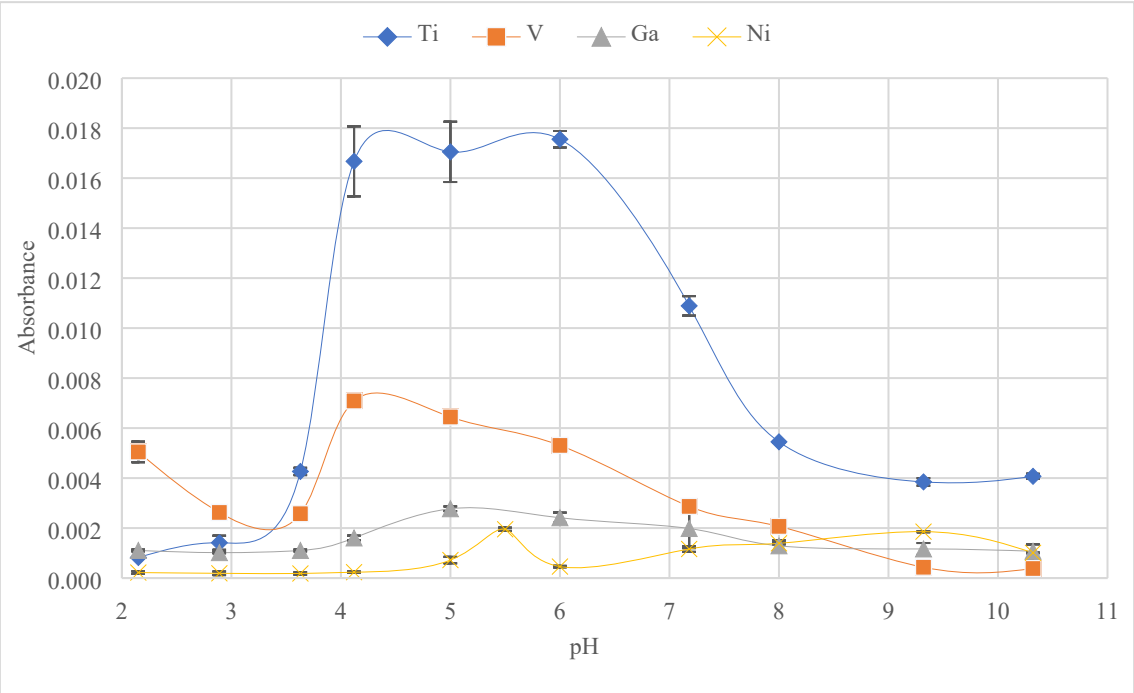

Figure SM3. Dependence of the pH on the absorption of the element on the sorbent obtained with a standard of 15.0 µg L−1 V, Ti, 30 µg L−1 Ni and 1.5 µg L−1 Ga as described in section 3.2.2. pH study.

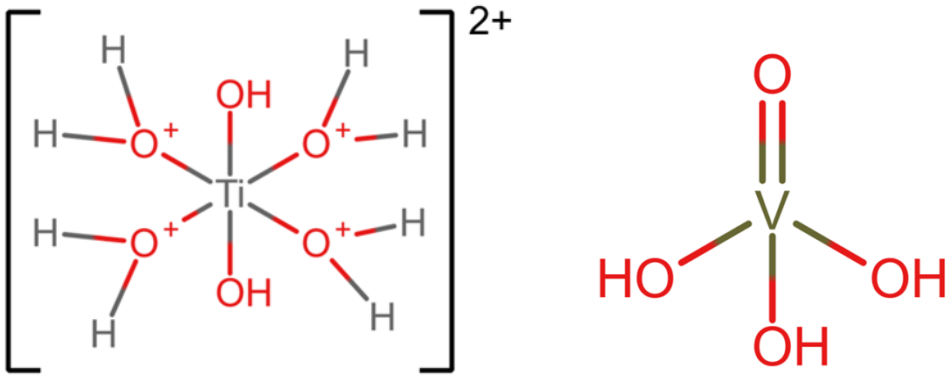

Figure SM4. (A) $[TiO]^{2+}$ oxo-cation forms in aqueous solutions and (B) vanadate

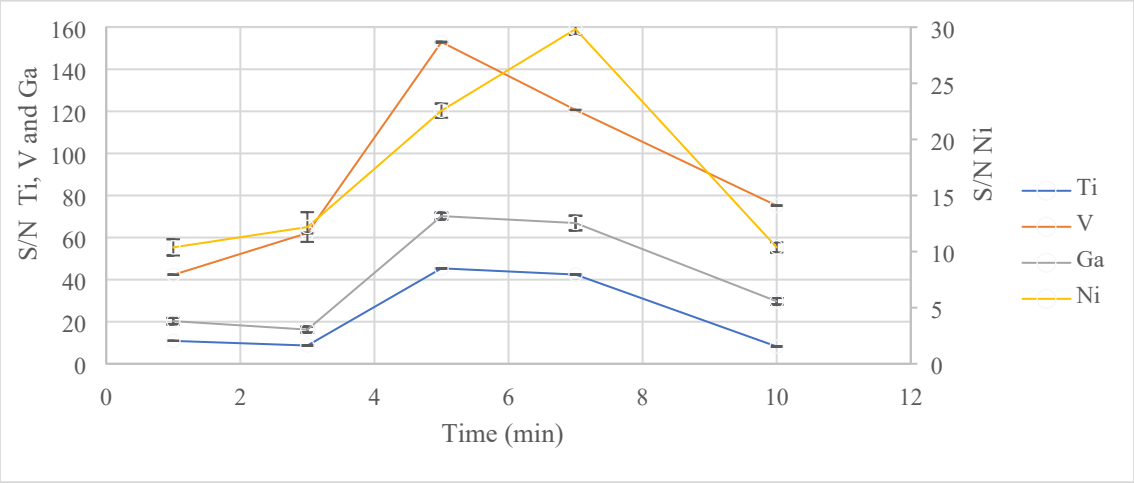

Figure SM5. Optimization of the adsorption time with a standard with 15.0 µg L^{-1} V, and Ti, 30 µg L^{-1} Ni, and 15 µg L^{-1} Ga. (pH 5.5, 2 mg M@GO-MTS, eluent 1 mL 6 % HNO_3, elution time 2 min)

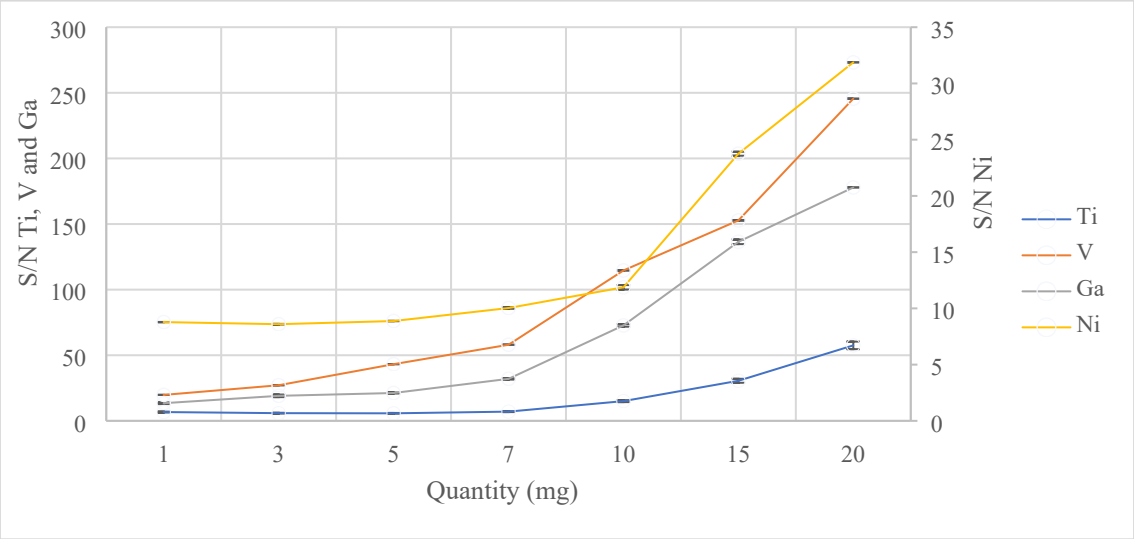

Figure SM6. Optimization of amount of M@GO-MTS, 30 µg L^{-1}Ti, 60 µg L^{-1} V, 60 µg L^{-1} Ga and 30 µg L^{-1} Ni (pH 5.5, eluent 1 mL 6 % HNO_3, adsorption time 5 min).

Bibliographic References

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