

## ANTHOCYANIN FROM RED BEETROOTS FOR SENSING AND REMOVING NICKEL IONS FROM WATER

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Anthocyanin is a natural colorant that is suspected to have chelation ability with metal ions. In this study, anthocyanin was extracted from red beetroots (*Beta vulgaris*), purified by chelating with basic lead acetate, reconverted, and used for qualitative analysis with the addition of various heavy metal ions ( $\text{Cd}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Cr}^{3+}$ ) that are considered as environmental pollutants. The aim was to investigate whether anthocyanin could be used as a sensing and chelating material for harmful heavy metal ions from water. UV-visible spectra were recorded within the same wavelength range (200 nm-900 nm) while adding micro drops of highly concentrated known aqueous solutions of these metal ions (0.1 M) to the anthocyanin solutions prepared by dissolving 0.100 g of precipitated anthocyanin in 3 mL of 5% HCl in methanol. Unlike the other heavy metal ions studied, only  $\text{Ni}^{2+}$  showed some spectral changes with an isosbestic point at  $\lambda_{\text{max}} \sim 430$  nm, in 5% HCl in methanol at pH 4.5, indicating  $\text{Ni}^{2+}$  to anthocyanin interaction, probably through coordinating anthocyanin to  $\text{Ni}^{2+}$  center. The spectral data also showed the appearance of a new band around 400 nm, upon adding  $\text{Ni}^{2+}$ . Hence, this study could be developed for using anthocyanin extracted from red beetroot for detecting  $\text{Ni}^{2+}$  present in water.

**Keywords:** Anthocyanin, Metal chelation, Coordination complex, Heavy metal ions, UV-visible spectrum