

ISOLATION AND SPECTROSCOPIC CHARACTERIZATION OF UREA FROM HUMAN URINE

Gongden J.J, Uduah O.V, Gurumyen K.K & Lohdip Y.N

Research Scholar, Department of Chemistry, University of Jos, P.M.B 2084, Jos, Nigeria

ABSTRACT

Urea (UC) becomes isolated per litre of human urine by evaporation/concentration, nitration, precipitation, crystallization and recrystallization. It is then characterized by $^1\text{H-NMR}$, $^{13}\text{C-NMR}$, UV-vis and FT-IR, melting point analysis, refractometry, pH and conductivity measurements. The percentage yields of urea obtained is 61.3% (~5.7g/L). The characterization of UC showed chemical shift of $^1\text{H-NMR}$, and $^{13}\text{C-NMR}$ at 2.75ppm and 163.78ppm respectively while UV-vis was 212.80nm and FT-IR result showed symmetric and asymmetric frequencies peaks of $\nu_s(\text{NH}_2)$ and $\nu_{as}(\text{NH}_2)$, a combination band of $\nu_s(\text{NH})$ and $\nu_{as}(\text{NH})$, C=O and $\nu(\text{C-N})$ all stretched. It is a white needle-like structure, very soluble in water, but slightly soluble in ethanol and methanol. Other results of the physical properties of UC are pH (27°C) = 5.70, refractive index (n) = 1.321, melting point = 135 – 141 (°C) and electric conductivity = 1.9×10^{-4} . The XRD showed the crystal to be amorphous. The results obtained revealed that useful substance, urea, can be isolated using simple methods for possible use as a ligand for synthesis of urea-based complexes and for the production of urea-based fertilizer, where pure urea is not available or costly which complement Green chemistry.

KEYWORDS: Urea, Human Urine, Spectroscopic, Characterization

Article History

Received: 23 May 2019 | Revised: 17 Jun 2019 | Accepted: 31 Jul 2019
