

Abstract Submitted  
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**Inhibition of urinary calculi – a spectroscopic study**<sup>1</sup> FELICIA MANCIU, JAYESH GOVANI, WILLIAM DURRER, LAYRA REZA, LUIS PINALES, Physics Department, University of Texas at El Paso, El Paso, TX 79968 — We present multi-technique spectroscopic investigations by Raman, infrared absorption, X-ray photoelectron spectroscopy (XPS), and photoluminescence on the effects of the herb *Rotula Aquatica Lour (RAL)* on the growth of synthetically prepared Mg-based calculi of similar composition to common urinary calculi. Three samples were prepared; one MgPO<sub>4</sub>-based standard and two others, separately incorporating 1 wt.% and 2 wt.% *RAL* herbal extract. Raman and infrared data show a newberyite structure for the crystals without and with inhibitor. XPS revealed the unexpected presence of Zn and a significant increase in Mg in the samples with *RAL* inhibitor. The presence of metallic Zn may contribute to the inhibition process by initiating rapid stone formation. XPS and Raman results also suggest another mechanism of inhibition by revealing evidence for Mg-O bonding between the plant extract and the phosphate units of urinary calculus. Similarity between our photoluminescence measurements and those of *in vivo chlorophyll a* provides additional evidence of Mg-related inhibition.

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