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A study on the potential of kappa-carrageenan and carboxymethylcellulose in extended release potassium chloride capsules

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The drug of choice in preventing and treating hypokalemia is Potassium chloride (KCl). Extending the release of KCl is intended to slow down and prolong the release of potassium in order to reduce the gastrointestinal irritation brought about by KCl. This study aims to discover the feasibility of an extended release KCl capsule formulation using the ideal 1:2 cellulosic ratio of CMC and Kappa-Carrageenan obtained from a previous study, Comparative Study of the Cellulosic Ratio of Carboxymethylcellulose: Kappa-Carrageenan As A Potential Drug Delivery System (Cruz et. al, 2012) by means of compatibility determination, actual formulation of drug product and testing for compliance to monograph specifications for dissolution. The extended release KCl formulation in this study was prepared by means of microencapsulation, oven drying at 85°C and particle size reduction through sieving prior to capsule filling. A sample of the granules from the prepared formulation and the chief ingredients (including CMC, KC and KCl) each underwent Differential Scanning Calorimetry performed by professionals in RCNAS for compatibility determination. The capsules were tested for dissolution by employing the procedures and specifications of USP for extended release KCl capsules. The aliquots were diluted for preparation for AAS to determine the absorbance of the samples necessary for the computation of sample concentration. The data collected were analyzed by using One-Way ANOVA F test and Pearson r correlation. No significant change was seen in the data. It was concluded that the said formulation poorly exhibited extended release property.