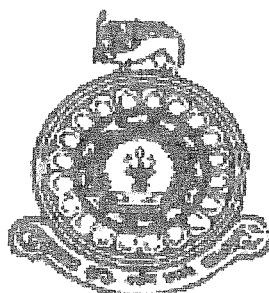


Quantitative determination of cobalt and  
copper in commercial animal supplement  
and its raw material



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## Abstract

The mineral mixture called Aminol is a commercial product that contains mineral ions such as  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{K}^+$ ,  $\text{Na}^+$ ,  $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Se}^{2+}$  and  $\text{PO}_4^{3-}$ . It is widely used in Sri Lanka as a nutrient supplement for live stock consumption. In Sri Lanka, Aminol is manufactured and marketed by Messers Astron Limited Ratmalana. Atomic absorption spectroscopy (AAS) is the standard method currently in existence to determine the concentrations of the metal ions present in Aminol. Despite the reliability of the results produced in analysis using AAS, it has several drawbacks associated with it such as, the necessity of advanced equipment, hence unavailability at medium scale industrial level or to farmers. The purpose of this study was to develop a simplified method to test whether the labelled quantities of metal ions are available in the correct amounts in commercial packs of Aminol. Separate pure standard samples of raw material containing each of the metal ions mentioned above were quantified using AAS. Commercial samples of Aminol were also tested using AAS. Colourimetric methods were developed to determine as low  $\text{Co}^{2+}$  as 0.003 % and  $\text{Cu}^{2+}$  as low as 0.1 % in commercial Aminol. The results of the colourimetric method showed 90 % agreement with the results obtained using AAS. The absorbance of the yellow coloured complex formed between  $\text{Co}^{2+}$  and 1-nitroso-2-naphthol-3,6-disulphonic acid disodium salt was measured at 520 nm. The absorbance of the blue colour copper complex formed between  $\text{Cu}^{2+}$  and tetraethylenepentmine (TEPA) was measured at 620 nm. The pure standard samples of raw material mentioned above were also tested using the developed colourimetric methods. AOAC and modified AOAC methods result were same. Therefore modification of AOAC method is not useful for this analysis. All average value and the label claim of statistical data are not significantly different at the 1 % level in raw material analysis using AAS. Average value and the label claim of statistical data are not significantly different at the 1 % level in Aminol analysis using AAS except  $\text{Ca}^{2+}$  analysis. Average value and the label claim of statistical data are significantly different at the 1 % level in raw material and Aminol analysis using colourimetric methods except  $\text{Co}^{2+}$  content in Aminol using AOAC and  $\text{Cu}^{2+}$  content in Aminol using AOAC and modified AOAC methods.