MEETING RECORD SHEET

MEETING DETAILS

Date: 9th May 2012 **Location:** Telecon

Project Number: P0186 PMC Precious Metal Cyanides

Purpose: To discuss the analytical methods available for the measurement of free cyanide in relation to mammalian toxicity endpoints

Participants:
Paul Whitehead (PW) (wca)
Becky Marks (BM) (wca)
Neil Truslove (NT) (Intertek)
Ruediger Thiele (RT) (Heraeus)
Roland Brasch (RB) (Heraeus)

MEETING NOTES

The Intertek proposal for measurement of free cyanide at physiologically relevant pH values indicates the use of a colourimetric method. RT has concerns over the use of such a method to measure free cyanide dissociation from the precious metal cyanide complexes. Complexes can potentially be formed with the colouring agents, leading to results that might show a greater dissociation of free cyanide than would occur normally.

Alternative methods for measuring free cyanide were discussed. Measurement using the Ion Selective Electrode (ISE) method was tried for analysing the solutions from the ecotoxicity studies for this project. Intertek have found it difficult to obtain the equipment to use for this method and spent two weeks trying to get the method to work, before returning the equipment to the supplier. They have been unable to obtain the equipment from any other supplier as it seems that this method is no longer widely used. Ion chromatography could be used, but this would require a new column and new electrodes to be purchased at a cost of ~ £1200. Detection limits would not be as low as for the colorimetric method, at around 1 ppm. Another method that could be used would be steam distillation of the cyanide at pH of 0.1 M (stomach pH). The cyanide could then be measured using any of the analytical methods as it would no longer be complexed. This could give detection limits of <1 ppm and is a method used for effluent CN analyses.

RT and NT agree that levels of free cyanide released from these precious metal complexes are likely to be very low. RT suggested that if we could obtain stability constants and therefore calculate the amount of free cyanide that is likely to be released, this could be validated using analytical measurement.

It was agreed that both Heraeus and wca would search through the data on the precious metal cyanide complexes and determine whether stability constants are available for the complexes that could be used to calculate free cyanide dissociation. If calculations can be conducted then further discussion will be held with Intertek in about a week's time in order to determine which method (likely ion chromatography or steam distillation) should be used in order to validate the calculations.

One option would be to conduct some acute toxicity testing and some analytical measurements in order to determine whether read across could be applied. However, If all mammalian toxicity tests were to be conducted (worst case) this would lead to test costs of ~ €200,000 per substance.

ACTION HERAEUS: Search for stability constants for the precious metal cyanide complexes and feed back to wca
ACTION WCA: Search for stability constants for the precious metal cyanide complexes and feed back to Heraeus