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English Version

Characterization of waste - Sampling and analysis of weak acid dissociable cyanide discharged into tailings ponds

Caractérisation des déchets - Échantillonnage et analyse des cyanures à acide faible dissociable déversés dans des bassins à stériles

Charakterisierung von Abfällen - Probenahme und Analyse von mit schwachen Säuren freisetzbare Cyaniden bei der Einleitung in Absetzteiche

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Foreword

This document (CEN/TS 16229:2011) has been prepared by Technical Committee CEN/TC 292 “Characterization of waste”, the secretariat of which is held by NEN.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, (Mandate M/395), which assigned the development of standards on the characterization of waste from extractive industries

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Introduction

As gold typically occurs at very low concentrations it is often extracted from the ore using a cyanide leaching process. The waste from which the gold was removed is referred to as residue or tailings material. Tailings, usually slurry, are pumped to a pond after treatment with for example hydrogen peroxide or sulfur dioxide to destroy cyanides.

In “Directive 2006/21/EC on the management of waste from extractive industries” [1] the following is addressed in Article 13; no.6:

In the case of a pond involving the presence of cyanide, the operator shall ensure that the concentration of weak acid dissociable cyanide in the pond is reduced to the lowest possible level using best available techniques and, in any case, at waste facilities which have previously been granted a permit or have already been in operation on 1 May 2008 that the concentration of weak acid dissociable cyanide at the point of discharge of the tailings from the processing plant into the pond does not exceed 50 ppm as from 1 May 2008, 25 ppm as from 1 May 2013, 10 ppm as from 1 May 2018 and 10 ppm at waste facilities which are granted a permit after 1 May 2008.

Methods for sampling and analysis have been selected to ensure the aim of this directive. Methods described here are either EN or ISO standards with consideration of the Cyanide Code [2].

1 Scope

This CEN Technical Specification specifies methods for sampling and analysis of weak acid dissociable cyanide discharged into tailings ponds.

NOTE The document can be used to support the requirements in the Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14899, *Characterization of waste – Sampling of waste materials – Framework for the preparation and application of a Sampling Plan*

EN ISO 14403, *Water quality – Determination of total cyanide and free cyanide by continuous flow analysis (ISO 14403:2002)*

ISO 6703-2, *Water quality – Determination of cyanide – Part 2: Determination of easily liberatable cyanide*

3 Terms and definitions

3.1
tailings pond
engineered facility for managing tailings resulting from ore processing and for clearing and recycling of process water

NOTE Tailings ponds are most of the times formed by a dam construction. They mainly contain tailings along with varying amounts of free water [3].

3.2
cyanide
chemical compound that contains the cyano group (C≡N), occurs either as free cyanide or bound to a metal in complex form

NOTE Free cyanide is very toxic.

3.3
weak acid dissociable (WAD) cyanide
cyanide from substances with cyanide groups and a measurable hydrocyanic acid vapour pressure at pH = 4 and room temperature.

[ISO 6703-2]

NOTE 1 Such substances include all cyanides which will undergo chlorination, especially hydrocyanic acid, alkali- and alkali earth metal cyanides, and complex cyanides of zinc, cadmium, silver, copper and nickel. Complex cyanides of iron and cobalt, nitriles, cyanates, thiocyanates and cyanogen chloride are not included

NOTE 2 Weak acid dissociable cyanide is also referred to as “easily liberatable cyanide”.