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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 20814-2014

Replacing GB 20814-2006

**Limit and determination of the quantity of heavy-metal
elements in dye products**

染料产品中重金属元素的限量及测定

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Quarantine of the People's Republic of China;
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Table of Contents

1	Scope	
2	Normative references	
3	Requirements	
4.3	Reagents and materials	
4.4	Instruments and equipment	
4.5	Test procedure	
4.5.2	Preparation of sample solution	
5	Test Report	
6	Iron -Fe Flame 248.3 0.02	
7	Hg (mercury) Hg 4	
8	Mn (manganese) Mn 1000	
9	Ni (nickel) Ni 200	
10	Lead -Pb Flame 283.3 0.04 11 -Sb antimony hydride Method 217.6 0.0004 12 213.9	
11	Sb (antimony) Sb 0 ~ 0.05	
12	Zinc (zincum) Zn 1500	

Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules. This standard replaces GB 20814-2006 "Limit and determination of dye products of 10 kinds of heavy metal elements," and GB 20814-2006 phase Ratio, in addition to editorial changes outside the main technical changes are as follows:

- Standard name was changed to "dye products in Limit and determination of heavy metal elements" (see standard name, the name of the 2006 version of the standard He said);
- Increased arsenic, mercury limits (see Chapter 3);
- Modify the reagents and materials content (see 43, 2006 version 4.2.);
- Modify the contents of the instruments and equipment (see 44, 2006 version 4.3.);
- Modify the content standards and increased working solution prepared (see 451, 2006 edition 4.4.1.);
- Increasing the content of the sample preparation solution (see 4.5.2); Preparation
- sample pretreatment incorporated into the sample solution and modify the presentation

and content (see 45212, 2006 version 4.4.2...);

--- Increase the detection limit content (see

--- Modify the contents of the result of the determination (see 4.6, version

4.5 in 2006). The standard proposed by China Petroleum and Chemical Industry Association. This standard by the National Standardization Technical Committee Dye (SAC/TC134) centralized. This standard was drafted. Shenyang Chemical Research Institute Co., Ltd., Jiangsu Yabang Dye Co., Ltd., Beijing Institute of Clothing, Taizhou production Product quality supervision, inspection, Wang Jinhua double-Chemical Co., Ltd., the State Quality Supervision and Inspection Center dye. The main drafters of this standard. Wang Yong, Zheng Junliang, Zhou Yongkai, Huangyin Bo, Zhang Guodong, Kiran Qin, Liu Li, Shen Jiong day. This standard replaces the standards previously issued as follows:

--- GB 20814-2006. Limit and determination of heavy metal elements in dye products

1 Scope

GB 20814-2014 is the Chinese national standard on limit and determination of the quantity of heavy-metal elements in dye products, in the field of chemical technology. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 24 July 2014 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 May 2015. Classification: ICS 71.100.01, CCS G57. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the permissible content (Limited) and its determination dye products of 12 heavy metal elements. This standard applies to all types of formulations of commercial dyes.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document. Laboratory use specifications and test methods GB/T 6682-2008 Analysis

GB/T 8170-2008 revised value represents about rules and limit values and judgment JJG694 atomic absorption spectrophotometer

3 Requirements

Limited dye products contain heavy metal elements should meet the requirements in Table 1. For liquid dyes, paints and other products heavily paste Metallic elements shall be limited solids content for conversion.

4.3 Reagents and materials

4.3.2 perchloric acid.

4.3.3 mixed acid. perchloric acid and nitric acid volume ratio = 3.

4.3.4 hydrochloric acid.

4.3.5 hydrochloric acid solution. hydrochloric acid and water volume ratio = 5.

4.3.6 hydrogen peroxide.

4.3.7 sulfuric acid.

4.3.8 Potassium dichromate.

4.3.9 sulfuric acid - potassium dichromate solution. 60mL potassium dichromate sulfuric acid 1g/L.

4.3.10 potassium iodide.

4.3.11 thiourea.

4.3.12 KI - thiourea mixture. 10g 5g potassium iodide and thiourea was dissolved in 100mL of water.

4.3.13 sodium borohydride or potassium borohydride.

4.3.14 sodium hydroxide.

4.3.15 high-purity acetylene gas.

4.4 Instruments and equipment

4.4.1 Atomic Absorption Spectrometer. JJG694 shall comply with the requirements.

4.4.2 Microwave digestion.

4.5 Test procedure

4.5.1 Preparation of standard working solution Standard stock solution preparation 4.5.1.1

4.5.1.1.1 As formulated standard stock solution. Pipette with standard solution 1.00mL As in 1000mL volumetric flask 0.2mol/L nitric acid solution constant volume. Dubbed 1.00mg/L of standard stock solution. 4.5.1.1.2 Cd preparation of standard stock solution. Pipette with

standard solution Cd 1.00mL in 100mL volumetric flask 0.2mol/L nitric acid solution constant volume. Dubbed 10.00mg/L of standard stock solution. 4.5.1.1.3 Co preparation of standard stock solution. use pipette Co standard solution 5.00mL in 100mL flask or 10.00mL In with 0.2mol/L nitric acid solution constant volume. Dubbed 50.00mg/L or 100.00mg/L of standard stock solution. 4.5.1.1.4 Cr preparation of standard stock solution. use pipette Cr standard solution 5.00mL in 100mL flask or 10.00mL In with 0.2mol/L nitric acid solution constant volume. Dubbed 50.00mg/L or 100.00mg/L of standard stock solution. 4.5.1.1.5 Cu formulated standard stock solution. Pipette with Cu standard solution 2.00mL in 100mL volumetric flask 0.2mol/L nitric acid solution constant volume. Dubbed 20.00mg/L of standard stock solution. 4.5.1.1.6 Fe formulated standard stock solution. Pipette with standard solution 5.00mL Fe or 10.00mL in 100mL flask In with 0.2mol/L nitric acid solution constant volume. Dubbed 50.00mg/L or 100.00mg/L of standard stock solution. 4.5.1.1.7 Hg preparation of standard stock solution. Pipette with standard solution 1.00mL Hg in 1000mL volumetric flask 0.2mol/L nitric acid solution constant volume. Dubbed 1.00mg/L of standard stock solution. 4.5.1.1.8 Mn preparation of standard stock solution. Pipette with Mn standard solution 2.00mL in 100mL volumetric flask 0.2mol/L nitric acid solution constant volume. Dubbed 20.00mg/L of standard stock solution. Ni formulated standard stock solution 4.5.1.1.9. The pipette Ni standard solution 5.00mL in 100mL flask or 10.00mL In with 0.2mol/L nitric acid solution constant volume. Dubbed 50.00mg/L or 100.00mg/L of standard stock solution. 4.5.1.1.10 Pb formulated standard stock solution. Pipette with Pb standard solution 5.00mL in 100mL flask or 10.00mL In with 0.1mol/L nitric acid solution constant volume. Dubbed 50.00mg/L or 100.00mg/L of standard stock solution. 4.5.1.1.11 Sb preparation of standard stock solution. Pipette with standard solution 1.00mL Sb in 1000mL volumetric flask 0.2mol/L nitric acid solution constant volume. Dubbed 1.00mg/L of standard stock solution. 4.5.1.1.12 Zn formulated standard stock solution. Pipette with Zn standard solution 1.00mL in 100mL volumetric flask 0.2mol/L nitric acid solution constant volume. Dubbed 10.00mg/L of standard stock solution.

4.5.1.2 formulated standard working solution 4.5.1.2.1 standard solution concentration range Suitable for all standard working solution concentration range of each standard curve measured heavy metal elements are shown in Table 2. Table 2 standard working solution concentration No. Element Name Symbol element concentration range/(mg/L) 1 arsenic (arsenic) As 0 ~ 0.05

4.5.2 Preparation of sample solution

4.5.2.1 sample pre-treatment 4.5.2.1.1 microwave digestion Dye weighed sample of about 0.1g ~ 0.5g (accurate to 0.0001g), placed in the digestion tube was added 8mL of concentrated nitric acid, 2mL peroxide Hydrogen. Digestion was allowed to stand overnight or cover lid inner tube in supporting the heating plate at 80 °C ~ 100 °C preheating 20min, at room temperature so that the sample Products and concentrated acids and hydrogen peroxide complete the initial response (to smoke or not obviously bubbling) was cooled to