ONLINE ISSN : 1348-2246
PRINT ISSN : 0910-6340

Analytical Sciences
Vol. 26 (2010) , No. 2 p.277

[PDF (299K)] [References]

X-ray Fluorescence Analysis of Cr^{6+} Component in Mixtures of Cr_2O_3 and K_2CrO_4

Tatsunori TOCHIO[1)], Shusuke SAKAKURA[2)], Hirofumi OOHASHI[3)], Hirohisa MIZOTA[2)], Yanhui ZOU[2)], Yoshiaki ITO[2)], Sei FUKUSHIMA[4)], Shigeo TANUMA[4)], Takashi SHOJI[5)], Hajime FUJIMURA[5)] and Michiru YAMASHITA[6)]

1) Department of Physics, Faculty of Science, Kobe University
2) Institute for Chemical Research, Kyoto University
3) Harima Office, National Institute for Materials Science
4) National Institute for Materials Science
5) X-ray Research Institute, Rigaku Industrial Corp.
6) Hyogo Prefectural Institute of Technology

(Received September 1, 2009)
(Accepted December 11, 2009)

X-ray fluorescence analysis using Cr K_α spectra was applied to the determination of the mixing ratio of Cr^{6+} to (Cr^{6+} + Cr^{3+}) in several mixtures of K_2CrO_4 and Cr_2O_3. Because the powder of K_2CrO_4 contained large particles that were more than 50 μm in diameter, it was ground between a pestle and a mortar for about 8 h. The coarse particles still remaining were removed by using a sieve with 325-mesh (44 μm) in order to reduce the difference in absorption effects between emissions from Cr^{6+} and those from Cr^{3+}. The mixing ratio, $K_2CrO_4/(K_2CrO_4 + Cr_2O_3)$, of the five mixtures investigated is 0.50, 0.40, 0.20, 0.10, and 0.05 in weight, respectively. Each spectrum obtained was analyzed by decomposing it into two reference spectra, those of the two pure materials, K_2CrO_4 and Cr_2O_3, with a constant background. The results for the mixtures containing K_2CrO_4 of more than 20 wt%

are that the relative deviation from the true value is less than ~5%. On the other hand, when the content of K_2CrO_4 decreases to less than 10 wt%, the relative deviation gets so large as 20 – 25%. The error coming from a peak separation of spectrum involved in our results were estimated by applying our method to five sets of data for each mixture computationally generated, taking into account the uncertainty in total counts of real measurements.

To cite this article:

Tatsunori TOCHIO, Shusuke SAKAKURA, Hirofumi OOHASHI, Hirohisa MIZOTA, Yanhui ZOU, Yoshiaki ITO, Sei FUKUSHIMA, Shigeo TANUMA, Takashi SHOJI, Hajime FUJIMURA and Michiru YAMASHITA, *Anal. Sci.*, Vol. *26*, p.277, (2010) .

doi:10.2116/analsci.26.277

JOI JST.JSTAGE/analsci/26.277