Title: On the Leaching of Domestic Chromite Ore in Sulfuric Acid

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ABSTRACTS

microdiffraction by Suito and Uyeda. The interplanar spacings of α-form copper-oxinate 2 hydrate calculated from X-ray diffraction patterns accord with the Hull and Daveys diagram for tetragonal system at the position of about 1.6 for c/a value. The interplanar spacings calculated, by assuming the cell constants as a = b = 6.57Å, c = 15.56Å and α = β = 6 = 90°, agreed with the above experimental results with accuracy of 1%.

It is concluded that α-form copper-oxinate 2 hydrate, which precipitates from the solution, transforms into stable β-form, in the same way as in the case of copper-phthalocyanine.

On the Leaching of Domestic Chromite Ore in Sulfuric Acid

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To obtain a pure chromic sulfate electrolyte for the production of metallic chromium, the leaching conditions of a domestic ore (48.7% Cr₂O₃ and 12.6% FeO) in sulfuric acid containing small amount of (NH₄)₂Cr₂O₇ were studied.

Sample: The chromite ore fromNumaoshi in Hokkaido was crushed by an Engelbach crusher, and sieved by a standard Tyler sieve.

Operation: Crushed ore was digested in 300-ml. porcelain beaker under atmospheric presssure, or in a 2-l lean-lined autoclave under high pressure. A mixed solution of sulfuric acid and (NH₄)₂Cr₂O₇ was used as leaching solution. After leaching the liquor was filtered. The amounts of Fe and Cr in the filtrate and precipitate were analysed.

Items of experiments:

Table 1. Optimum leaching conditions of Numaushi chromite.

<table>
<thead>
<tr>
<th>Leaching conditions</th>
<th>Under atmospheric press.</th>
<th>Under high press</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of ore (mesh)</td>
<td>-200</td>
<td>-200</td>
</tr>
<tr>
<td>Conc. of H₂SO₄ (%)</td>
<td>70~80</td>
<td>60  40  20</td>
</tr>
<tr>
<td>Leaching temp. (°c)</td>
<td>150~170</td>
<td>150 170 190</td>
</tr>
<tr>
<td>Pressure (kg/cm²)</td>
<td>—</td>
<td>3   7   11</td>
</tr>
<tr>
<td>Leaching time (hr)</td>
<td>&gt;2</td>
<td>—   &gt;4 —</td>
</tr>
<tr>
<td>Weight ratio of H₂SO₄ to ore</td>
<td>6.6</td>
<td>—   3 —</td>
</tr>
<tr>
<td>Weight ratio(NH₄)₂Cr₂O₇</td>
<td>0.15~0.20</td>
<td>0.15~0.20</td>
</tr>
<tr>
<td>Extraction of Cr(%)</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>
ABSTRACTS

Effects of leaching conditions on the extraction of chromium were studied.  
1. Size of ore, 2. Leaching time, 3. Amount of (NH₄)₂Cr₂O₇ added, 4. Leaching 
temperature, and 5. Amount of charge.

Summary of Result: Results obtained are summarized in Table 1, which 
shows the optimum conditions for extraction of chromium.

If the acid concentration was increased up to 60%, insoluble brownish-yellow 
precipitate was formed in the presence of (HN₄)₃Cr₂O₇ in both cases of leaching.

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Reaction of n-Hexyl Bromide with Potassium Fluoride 
in Several Glycols

Hisao Kitano and Ken-ichi Fukui

(Kodama Laboratory)


Reactions of n-hexyl bromide with potassium fluoride in isomeric propanediols 
and butanediols are studied. n-Hexylfluoride is obtained in high yields by the use of 
such glycols that have two adjacent hydroxy groups in the molecule. Two geometri- 
cal isomers of 1,2-cyclohexanediols are used as the solvent. The yield of n-
hexyl fluoride is ca. 30% in the trans isomer, whereas it's only 2% in the cis isomer.

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Nitration of Desoxybenzoin

Michiyasu Sugii and Risaburo Nakai

(Nakai Laboratory)


The reaction routes of desoxybenzoin with nitric acid (d=1.30) were studied by 
using C¹⁴-tracer technique. By the nitration of desoxybenzoin-carbonyl-C¹⁴ (I) 
(12.95µc/m.mole) there were obtained p-nitrobenzil-carbonyl-C¹⁴ (II) (12.92µc/m.-mole), benzil-carbonyl-C¹⁴ (III) (12.96µc/m.mole), inactive p-nitro-benzoic acid (IV) 
and benzoic acid-carboxyl-C¹⁴ (V) (11.29µc/m.mole). When treated with alcoholic 
potassium hydroxide, II decomposed into inactive p,p'-azoxydibenzoic acid, inactive 
p-nitrobenzoic acid and benzoic acid-carboxyl-C¹⁴ (12.96µc/m.mole). These facts 
indicate that the nitration occurs at the para position to the methylene group of I.

The non-labeled specimens of p-nitrodesoxybenzoin, p-nitrobenzil, and benzil 
were treated with the nitric acid, respectively. p-Nitrodesoxybenzoin gave benzoic 
acid, p-nitrobenzoic acid, and p-nitrobenzil. Benzel and p-nitrobenzil, however, were 
resistant to nitration and oxydation, and were recovered without loss. The specific 
activity of V is comparatively lower than the theoretical value. These results 
would lead to the following conclusions. In the action of the nitric acid on 
desoxybenzoin-carbonyl-C¹⁴, the p-nitrodesoxybenzoin-carbonyl-C¹⁴ is formed as an 
intermediate, and its methylene group is oxidized to p-nitrobenzil-carbonyl-C¹⁴.

While oxidative disruption of the same intermediate gives benzoic acid-carboxyl-C¹⁴.