A Crystalline Hypochlorite with Ease of Handling

**NaClO • 5H₂O**

**Advantages**
- A Crystalline Compound Capable of Being Weighed
- Stable for Long Term in a Refrigerator
- Effective for the Oxidations of Hydroxy Groups and Sulfur-containing Compounds

### Oxidations of Secondary Alcohols

1. **NaClO·5H₂O (2.0 g, 12.2 mmol)** is added in one portion to a mixture of Bu₄NHSO₄ (0.17 g, 0.50 mmol), TEMPO free radical (21 mg, 0.13 mmol), and 2-octanol (1.30 g, 10.0 mmol) in CH₂Cl₂ (10 mL) at 5 °C. The reaction is stopped after 0.5 h by quenching with aq. sat. Na₂SO₃ solution (20 mL). The organic layer is separated, and the aqueous layer is extracted with CH₂Cl₂ (30 mL). The combined organic layers are washed with H₂O (30 mL), dried over Na₂SO₄, concentrated and distilled to give 2-octanone as a colorless oil (95% yield).

2. **NaClO·5H₂O (2.0 g, 12.2 mmol)** is added in one portion to a mixture of Bu₄NHSO₄ (0.17 g, 0.50 mmol), TEMPO free radical (21 mg, 0.13 mmol), and 2-octanol (1.30 g, 10.0 mmol) in CH₂Cl₂ (10 mL) at 5 °C. The reaction is stopped after 0.5 h by quenching with aq. sat. Na₂SO₃ solution (20 mL). The organic layer is separated, and the aqueous layer is extracted with CH₂Cl₂ (30 mL). The combined organic layers are washed with H₂O (30 mL), dried over Na₂SO₄, concentrated and distilled to give 2-octanone as a colorless oil (95% yield).

### Application Example (reaction formula 1)

**Sodium Hypochlorite Pentahydrate** 25g / 500g [S0939]

**Related Products**

- TEMPO Free Radical 5g / 25g [T1560]
- Tetrabutylammonium Hydrogen Sulfate 25g / 100g / 500g [T0835]

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Other Applications

Syntheses of Sulfonyl Chlorides from Disulfides or Thiols

![Chemical structure](image1)

Chlorination: S0939
AcOH, rt
Y. 80%

S0939
AcOH, rt
Y. 95%


An Oxidative Cleavage of 1,2-Diols

![Chemical structure](image2)

(trans 1,2-diol)

Oxidation of Sulfides by an Equivalent Control

![Chemical structure](image3)

<table>
<thead>
<tr>
<th>NaClO</th>
<th>X eq.</th>
<th>time (h)</th>
<th>solvents</th>
<th>NMR ratio (%)</th>
<th>GC area (%)</th>
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<tbody>
<tr>
<td>S0939</td>
<td>1.1</td>
<td>0.3</td>
<td>CH3CN : H2O</td>
<td>0</td>
<td>98</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>12% NaClO aq.</td>
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<td>S0939</td>
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<td>2</td>
<td>Toluene : H2O</td>
<td>0*</td>
<td>0*</td>
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<td></td>
<td>2.4</td>
<td>24</td>
<td>Toluene</td>
<td>40*</td>
<td>1*</td>
</tr>
</tbody>
</table>


Oxidation of Sulfides by an Equivalent Control

M. Kirihara, et al., Synlett 2015, 26, 2547.


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