[Supplementary material]

A jade parrot from the tomb of Fu Hao at Yinxu and Liao sacrifice of the Shang Dynasty

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### Table S1. Heating experiments on nephrite (tremolite-actinolite)

<table>
<thead>
<tr>
<th>Samples</th>
<th>Amount of iron/colour</th>
<th>Temperature (°C)</th>
<th>Holding time/heating equipment</th>
<th>Change of colour &amp; structure</th>
<th>Experimenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actinolite with 3.73% water</td>
<td>6.56%; green</td>
<td>400~600</td>
<td>Not marked</td>
<td>400~500°C: colour changed from green to brown, 1.68% of water loss at 400°C and Fe$^{2+}$ started to oxidise; 600°C: from brown to dark brown, and oxidisation of Fe$^{2+}$ completed; 800°C: 2.42% water loss; 950°C: 3.64%-3.73% water loss, and full phase transition of actinolite.</td>
<td>Belyankin &amp; Donskaya (1939)</td>
</tr>
<tr>
<td>Taiwan nephrite cat’s eye</td>
<td>3.0–3.5%; greenish-yellow</td>
<td>700~860</td>
<td>4 hours; electric kiln heating</td>
<td>700°C: colour changed from greenish yellow to yellow, structural water lost, and the mass decreased from 0.595g to 0.585g; 860°C: black and opaque, Fe$^{2+}$ oxidised into Fe$^{3+}$, and the mass increased to 0.594g.</td>
<td>Tan et al. (1978: 35–36)</td>
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<tr>
<td>Smoothly polished New Zealand nephrite, 20 × 20 × 8mm</td>
<td>W301 green; W302 yellow to green; W106 olive green; W103 olive</td>
<td>300~1000</td>
<td>Air heating; electric kiln heating</td>
<td>300°C: colour started to change; 650°C: evident change in colour and increase in hardness; Above 650°C: moved to electric-kiln heating, the characteristics of different samples are as below: 1. Structure of the high-quality tremolite W301 was</td>
<td>Beck (1981)</td>
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</tbody>
</table>
destroyed when it was heated to 1000°C. It had cracks and the colour changed to an opaque greyish-white. 2. The oxidised nephrite W302 grading from yellow to green turned reddish brown when it was heated to 650°C, grading darker towards the end that coincided with green in the unheated portion. 3. The softer olive-green semi-nephrite W106 had a typical dark outer skin when it was heated to 650°C; when heated to 1000°C, it was rusty colouring externally and opaque grey internally, with structured destroyed by crazing. 4. The olive oxidised outer skin of tremolite W103 continued to be oxidised and turned black to brown when heated to 650°C for 1 hour, while the dark-green inner portion changed to brown or silvery whitish-green. Particularly, the cracks caused by heating were circular feathered.

<p>| Liangzhu tremolite Bi (destroyed) | Fe/(Fe+Mg) =8.24; yellowish-green | 650°C for 1 hour; 950°C for 5 hours; electric kiln | 650°C for 1 hour: brownish black; 950°C for 5 hours: faded, whitened and the semi-transparency evidently decreased; during the heating process, Fe/(Fe+Mg) decreased gradually from Wen (1994) |</p>
<table>
<thead>
<tr>
<th>unearthed from Fanshan (M20:184)</th>
<th>heating</th>
<th>8.24 (unheated) to 7.25 (650°C) and 5.24 (950°C).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liangzhu actinolite jade Bi (destroyed) unearthed from Sidun, Changzhou (M3:59)</td>
<td>Iron amount unknown; dark green with greyish-white</td>
<td>400~500</td>
</tr>
<tr>
<td>Hetian nephrite</td>
<td>Iron amount unknown; bluish-white</td>
<td>1100</td>
</tr>
<tr>
<td>Tremolite</td>
<td>Iron amount unknown; cyan</td>
<td>700 1100</td>
</tr>
<tr>
<td>Material</td>
<td>IronAmount</td>
<td>Temperature</td>
</tr>
<tr>
<td>---------------</td>
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</tr>
<tr>
<td>Hetian nephrite</td>
<td>Low iron</td>
<td>500–1100°C (increasing every 100°C)</td>
</tr>
<tr>
<td>Tremolite</td>
<td>Iron amount unknown; green</td>
<td>500 650 850</td>
</tr>
<tr>
<td>Tremolite</td>
<td>Actinolite</td>
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larger and larger. They were banded and spread over the surface; 900°C~1200°C: the colour turned whitish yellow totally and the sample phase transferred to Ca-Mg pyroxene. 1200°C: hydroxyl peaks totally disappeared and the phase transition completed.
References


ZHANG, Y.N. 2011. The study on fake methods of white soak-induced color of