

LMHC Information Sheet # 2

Corundum

Lattice diffusion of foreign elements other than hydrogen

Members of the Laboratory Manual Harmonisation Committee (LMHC) have standardised the nomenclature that they use to describe any corundum that shows indications of heating accompanied by the introduction/diffusion of a chemical element from an external source, both for cases with clear supporting evidence and for those where indicators point to a possibility that this treatment has taken place but there is insufficient corroboration. See also Information Sheet #1.

1) Any corundum that shows indications of heating accompanied by the introduction/diffusion of a chemical element(s) (facilitating the modification or creation of colour) from an external source, shall be described as;

Species: (natural)¹ corundum

Variety: (treated)¹ sapphire² or ruby

Further information: Indications of heating, (shallow)³ colour modified / altered by....

additionally, either

(lattice) diffusion of (a) chemical element(s)4 from an external source

or

the introduction of (a) chemical element(s)⁴ from an external source

This clause encompasses the treatment previously described by gemmological laboratories as 'surface diffusion'. Those persons buying or selling stones to which the above clause applies sometimes use descriptions such as 'surface diffusion treated' or 'heated with the addition of e.g., beryllium, titanium etc.' These descriptions and others are commonly used trading terms but are not used by LMHC members.

2) Any corundum that shows indications of heating and indicators that point towards a possibility of externally sourced lattice diffusion, but there is insufficient corroboration, shall be described as;

Species: (natural)¹ corundum
Variety: sapphire² or ruby
Further information: Indications of heating
additionally, either

Further analyses are necessary to determine whether or not beryllium and/or other

chemical element(s) from an external source is (are) present

or

Heating may involve the diffusion of beryllium and/or other chemical element(s) from

an external source

© 2025 Laboratory Manual Harmonisation Committee. This document may be freely copied and distributed as long as it is reproduced in its entirety, complete with this copyright statement. Any other reproduction, translation or abstracting is prohibited without the express written consent of the Laboratory Manual Harmonisation Committee.

All rights jointly reserved by:

Central Gem Laboratory CGL (Japan), CISGEM Laboratory (Italy), DSEF German Gem Lab (Germany), GIA Laboratory (USA),
Gem and Jewelry Institute of Thailand GIT (Thailand), Gübelin Gem Lab Ltd. (Switzerland),
Swiss Gemmological Institute - SSEF (Switzerland)

¹ Wording in parenthesis is optional.

² 'Sapphire' alone is used for the blue variety of corundum. For other colours, 'sapphire' preceded by its colour (e.g. yellow sapphire, pink sapphire, etc.) is used.

³ The word 'shallow' shall be used when the created colour is shallow. A note cautioning against re-cutting may be included in the report.

⁴ As an option, when the diffused element has been identified, replace 'chemical element(s)' with the actual element(s) detected.