

Solvate Isomerism

When solvent molecules cross the coordination boundary.

Solvate Isomerism

The general phenomenon where solvent molecules differ by being directly bonded to the metal ion vs. existing as free molecules in the crystal lattice.

Hydrate Isomerism

The exact same phenomenon, specifically when the solvent involved is **water (H₂O)**.



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$$E=mc^2$$



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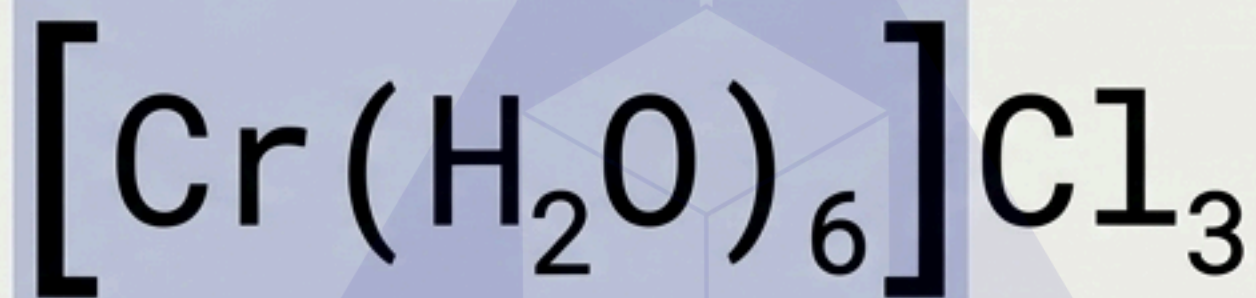
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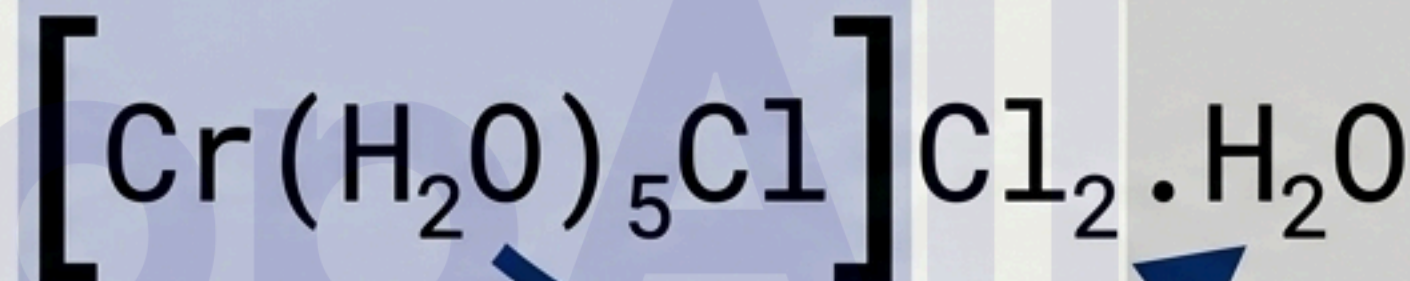
The Bracket Boundary in Action

The Violet Isomer



6 Water Molecules **BONDED**
inside the coordination sphere.

The Grey-Green Isomer



5 Water Molecules **BONDED**,
1 Water Molecule **FREE** in the
lattice.



The Dot-Notation

Anything after the dot represents free solvent molecules occupying spaces in the crystal lattice, not bonded to the metal.

Watch for this

Examiners will give you two formulas with the exact same total number of water molecules. Do not just count the atoms!

- The distinction relies entirely on **where** the water is—bonded (inside the bracket) vs free (after the dot).
- If the ratio of inside vs outside doesn't change, they are not solvate isomers.

Key Takeaways

- Solvate isomers have the exact same chemical formula but differ by whether the solvent is directly bonded to the metal or free in the crystal lattice.
- In 'Hydrate Isomerism' (where water is the solvent), always check the brackets and the 'dot' notation to see if the H_2O has shifted positions.



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