

Amide Water Solubility

Amides with **more than five carbon atoms** generally become less soluble in water. While smaller amides form hydrogen bonds with water, increasing the carbon chain length beyond five allows the non-polar/hydrophobic alkyl groups to dominate, reducing overall solubility. [1, 2, 3, 4]

Key Findings on Amide Solubility:

- **High Solubility (1–5 Carbons):** Amides with five or fewer carbons are considered soluble in water.
- **Reduced Solubility (>5 Carbons):** As the carbon chain increases beyond five, the hydrophobic character increases, reducing solubility.
- **Structure Impact:** Primary and secondary amides are generally more soluble than tertiary amides due to better hydrogen bonding, but the 5-carbon threshold generally applies to all amide types.
- **Structure vs. Size:** Solubility depends on the overall balance between the polar amide group and the non-polar alkyl/aryl groups. [1, 2, 3, 5, 6]

AI can make mistakes, so double-check responses

[1] https://saylordotorg.github.io/text_the-basics-of-general-organic-and-biological-chemistry/s18-15-physical-properties-of-amides.html

[2] https://chem.libretexts.org/Courses/Matanuska-Susitna_College/MatSu_College-CHEM_A104_Introduction_to_Organic_and_Biochemistry/15%3A_Organic_Acids_and_Bases_and_Some_of_Their_Derivatives/15.15%3A_Physical_Properties_of_Amides

[3] <https://brainly.com/question/44891626>

[4] <https://www.youtube.com/watch?v=O2U8diKANmI>

[5] <https://scienceready.com.au/pages/amides>

[6] <https://www.vedantu.com/chemistry/physical-properties-of-amines>