Question: Hexanol is less soluble in water than butanol. GIVE REASON

Answer: For example when Methanol (CH3OH) is added to Water, the dominant intermolecular force acting between the molecules is H-Bonding. By the general rule of Like-Dissolves-Like, these two compounds will dissolve in each other as each is capable of H-Bonding. However, as the number of Carbon atoms in the molecule increases, the dominant intermolecular force between the Alcohol and Water molecules becomes an LDF interaction.

Alcohol solubility chart

Name	Formula	Solubility
Methanol	CH_3OH	miscible
Ethanol	C_2H_5OH	miscible
Propanol	C_3H_7OH	miscible
Butanol	C_4H_9OH	0.11
Pentanol	$C_5H_{11}OH$	0.030
Hexanol	$C_6H_{13}OH$	0.0058
Heptanol	$C_7H_{15}OH$	0.0008

Decreasing from methanol to heptanol.