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<ul> <li>Olovsson, I. (2006) The role of the lone pairs in hydrogen bonding,</li> <li>Z. Phys. Chem. 220: 963–978.</li> </ul>	53
<ul> <li>Olovsson, I. (2006) Comparison of the proton transfer path in hydrogen bonds from theoretical potential energy surfaces and the concept of conservation of bond orders, Z. Phys. Chem. 220: 797–810.</li> </ul>	69
• Steiner, T. (2002) The hydrogen bond in the solid state, <i>Angew. Chem. Int. Ed.</i> <b>41</b> : 48–76.	83
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