

Solvents for Crystallization of Proteins

Over the past years a couple of papers were published, in which the use of ionic liquids in biocatalysis and/or the influence of ionic liquids on proteins was described. A very early study from *Magnusson et al.* described the activating influence of a low concentration of ethylammonium nitrate $[\text{EtNH}_3]^+ \text{NO}_3^-$ on the phosphatase from *E. coli*.^[1] *Iborra et al.* investigated 2001 the positive influence of different ionic liquids on stability and reactivity of α -chymotrypsine by using a transesterification reaction as an example.^[2] In another work, these results were confirmed by fluorescence- and CD-spectroscopy.^[3]



Lange et al. reported that ionic liquids accelerate the folding of selected proteins.^[4] Recently, *MacFarlane et al.* demonstrated successfully that a group of biocompatible ionic liquids is able to dissolve and stabilize Cytochrome-C.^[5]

Our own research focused on the stabilization and crystallization of enzymes, e.g. using Lysozyme in a number of different ionic liquids.^[6]

Our protein-crystallization kit contains:

- **1-Ethyl-3-methylimidazolium acetate**, [IL-0189-TG](#)
- **1-Ethyl-3-methylimidazolium diethyl phosphate**, [IL-0052-HP](#)
- **1-Ethyl-3-methylimidazolium trifluoromethanesulfonate**, [IL-0009-HP](#)
- **1-Ethyl-3-methylimidazolium ethylsulfate**, [IL-0112-HP](#)
- **1-Butyl-3-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide**, [IL-0035-HP](#)
- **1-Butyl-3-methyl-imidazolium dicyanamid**, [IL-0010-HP](#)
- **Triisobutylmethylphosphonium tosylate**, [IN-0011-TG](#)
- **Butyltrimethylammonium bis(trifluoromethylsulfonyl)imide**, [IL-0032-HP](#)
- **2-Hydroxyethylammonium formate**, [IL-0034-SG](#)
- **Ethylammonium nitrate**, [IL-0043-SG](#)
- If other ionic liquids are desired, please have also a look at [„myKit“](#).

- [1] D. K. Magnuson et.al., J.Solution Chem. **1984**, 13, 583-587.
- [2] J. L. Iborra et.al., Biotechnology and Bioengineering **2001**, 75, 563-569.
- [3] J. L. Iborra et.al., Biotechnology and Bioengineering **2004**, 88, 916-924.
- [4] C. Lange et.al., Protein Science **2005**, 14, 2693-2701.
- [5] D. R. MacFarlane et.al., Chem. Comm. 2005, 4804-4806.
- [6] T.J. Schubert, A. Bösmann, Patent Pending, **2004**, DE10200402719