

## Acidic and superacidic molecules: acidity in different media

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The presentation will give an overview of the approaches and problems in design and acidity measurements of acidic and superacidic molecules. Attainable acidity levels of superacids based on different molecular structures are examined. An overview is given about the possibilities of quantitative evaluation of superacid strength<sup>[1,2]</sup> and the associated problems. The trends of acidity change on transfer from one medium to another are reviewed (Figure 1)<sup>[3]</sup> and the principles of selection of medium for measurement of acidity of superacids are outlined. The recent advances in measurement of superacid strength are presented, in particular the acidity scale of strong acids in 1,2-dichloroethane (DCE) spanning for more than 15 orders of magnitude.<sup>[2]</sup> The scale contains 62 acids and is the most acidic acidity scale ever compiled in a medium of constant composition. Reliable liquid-phase acidity values have been measured for a number of practically important superacids, such as perchloric acid, trifluoromethanesulfonic acid, bis-triflyl imide, tetrafluoroboric acid, etc.<sup>[2]</sup>

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[3] E. Raamat, K. Kaupmees, G. Ovsjannikov, A. Trummal, A. Kütt, J. Saame, I. Koppel, I. Kaljurand, L. Lipping, T. Rodima, V. Pihl, I. A. Koppel and I. Leito. *J. Phys. Org. Chem.* **2013**, *26*, 162.

Figure 1. Acidities of some acids in water, acetonitrile, 1,2-dichloroethane and in the gas phase.

