

Polysulfonylamine, CXVII [1]

Wasserstoffbrücken in kristallinen Onium-dimesylamiden: Sechs systematisch variierte *sek.*-Ammonium-dimesylamide mit sechs verschiedenen null-, ein- oder zweidimensionalen Wasserstoffbrückenmustern

Polysulfonylamine, CXVII [1]

Hydrogen Bonding in Crystalline Onium Dimesylamides: Six Systematically Varied *sec.*-Ammonium Dimesylamides Exhibiting Six Different Zero-, One-, or Two-Dimensional Hydrogen Bonding Patterns

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In order to examine packing preferences and hydrogen bond patterns in secondary ammonium salts, low-temperature X-ray analyses were conducted for six compounds of general formula $R_2NH_2^+(MeSO_2)_2N^-$, where $R_2NH_2^+ = Me_2NH_2^+$ (**1**, triclinic, space group $P\bar{1}$), $MeEtNH_2^+$ (**2**, monoclinic, $P2_1/c$), $Et_2NH_2^+$ (**3**, triclinic, $P\bar{1}$), pyrrolidinium (**4**, triclinic, $P\bar{1}$), piperidinium (**5**, monoclinic, $C2/c$) or morpholinium (**6**, monoclinic, $P2_1/c$). Throughout the series, the constant anion retains a rigid conformation approximating to C_2 symmetry and thus provides a geometrically reliable set of five potential hydrogen bond acceptors. Nevertheless, the six compounds exhibit a variety of unpredictable packing patterns, showing that, in unfavourable cases, the steric demands of molecular fragments not involved in hydrogen bonding can substantially alter the structure of a family of ionic crystals. In the present structures, the NH_2^+ donor groups form hydrogen bonds $N^+ - H \cdots N^- / O$ to two (**3–6**) or three (**1, 2**) adjacent anions. The occurrence of various two-, three- and four-centre hydrogen bonds leads to six different patterns, resulting in cation–anion layers (**1, 2**), discrete formula unit dimers (**3, 4**) or cation–anion chains (**5, 6**); in the morpholinium salt **6**, these chains are associated into layers by a weak $N^+ - H \cdots O$ (cation) interaction. In each of the crystal packings, short $C - H \cdots O$ contacts with $H \cdots O \leq 270$ pm and $C - H \cdots O \geq 130^\circ$ are observed.