Polymers: A Property Database

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This is a large database giving a variety of properties for a very wide range of polymer types. The amount of information for individual polymers varies considerably and in some cases possibly surprisingly; for some polymers there is little more than a brief description, whereas for many common polymer types there are pages of detailed information.

The brief description of all polymer types gives the monomer(s), material class (e.g. thermoplastic), polymer type and CAS number. There are also normally synonyms and related polymers identified. Other information in this section might be molecular formula, fragments and some general information. For most polymers there is also detailed information on volumetric and calorific properties, surface properties and solubility, mechanical properties, electrical properties, information on polymer stability and information on applications/commercial products.

For common polymer types available in various forms (e.g. different types of filler), there are completely separate entries for many of the different forms. As an example, the first polymer listed in the database is ABS and there are then different entries for carbon reinforced ABS; extrusion grade unfilled ABS; flame retardant ABS; general purpose ABS; glass reinforced ABS; heat resistant ABS; high impact ABS; injection moulding, glass fibre reinforced ABS; injection moulding, unfilled ABS; stainless steel reinforced ABS and another seven entries for ABS blended with other polymers. Most of these entries have their own list of references but clearly there is a lot of replication. In contrast, the third main polymer type, in the database, is acetal copolymer for which there is little more than the brief description and a list of trade names but there is a later, slightly longer entry for polyoxymethylene.

For poly(vinyl chloride), there are separate entries for the plasticised and unplasticised polymer, as well as entries for crystalline PVC and a number of blends; there is also an entry for chlorinated PVC. For polyethylene, there are separate entries for VLDPE, LDPE, LLDPE, MDPE, HDPE and UWMWPE as well as many blends and copolymers.

While the entry for HDPE appears under polyethylene-HDPE, the other entries for polyethylene are in the position indicated by the initials. There are no entries for ethylene-vinyl acetate polymer but ethylene-vinyl alcohol is covered.

The database includes entries for a number of naturally occurring polymers as well as synthetic polymers. These include a number of protein-based materials as well as broad distribution polysaccharides.

The introduction explains the complexity of polymers as well as providing some general information and advice on the content of the database. The 'Name and Synonym Index' contains around 3,000 entries and is essential as the location of some entries is not very predictable.

There is also a web-accessed database containing the same information. While the hard copy is limited to the 'Name and Synonym Index', the web database, allows search against any of the very wide list of physical properties and it is easy to use. This search capability obviously has potential to be a powerful tool but it is limited to what is in the database—for a given polymer, if that physical property is not detailed in the database, it clearly cannot be found by a search.

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