# I/EC

## The Editor Looks at . . .

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**Acrolein and peracetic acid** are chemical building blocks with a lot of promise. Carbide's belief in them is made tangible by the acrolein unit at Institute, W. Va., and the peracetic acid plant being built. Twelve hundred derivatives of these compounds have been made on a lab scale. This month's Staff-Industry Collaborative Report describes three acrolein derivatives produced commercially, and a peracetic acid epoxide which will be made.

**Epoxies for special heat and light stability** may be made, by the way, with peracetic acid. Cyclohexene oxide derivatives developed by Carbide's research department show up well as plasticizer-stabilizers in vinyl resins. FMC's epoxyhexahydrophthalates show up well, too, as plasticizers with built in stabilizing properties for PVC, and Shell Chemical has some excellent data on epoxides used with cadmium or strontium soaps for PVC stabilization. Just how good epoxies are as plasticizers and stabilizers depends on the structure (Archer-Daniels-Midland gives a good example in this group of five epoxy articles) and they can be tailor-made to be primarily plasticizers or primarily stabilizers.

**Adhesives—mechanism and materials** are the subject of half a dozen articles in this issue, plus an epoxy-plasticized epoxy adhesive with improved shear strength and impact properties. Adhesion of polyethylene to stainless steel and of polyester resins to glass cover some of the special problems discussed in this group.

**Deep six for industrial wastes** is becoming common. Several companies not only take wastes "down to the sea in ships," but even dump commercial products (like caustic soda when the chlorine demand is high and the caustic market weak). Petrochemicals often have difficult-to-handle wastes: chlorinated products. Texas A&M's Department of Oceanography shows that deep sea disposal for these wastes can be done with no significant harm to marine life.

**High temperature radiation of hydrocarbons** is a little-explored field of great practical interest. Radiation-induced cracking done by Esso showed up as a long-chain reaction between 320° and 510° C. Product distribution was similar to that of thermal cracking. Atmospheric radio-cracking is apparently an ordinary radical chain reaction. Since radio-cracking yields increase as temperature increases, radiation and thermal cracking might conceivably be combined to increase or modify product yields.

**Predicting esterification kinetics** for oleic acid and isobutyl alcohol may be a good start toward use of cheaper alcohol raw materials for making aliphatic esters. Ohio State researchers have an empirical equation to predict conversion with an average deviation of less than 6%.

**Stabilizing fine-grained soils** has been a problem. Michaels at MIT has tried phosphoric acid, at 2 to 10% by weight. Stabilization was successful and $H_3PO_4$ acid looks like it may have considerable promise as a broad utility stabilizer for fine-grained soils. Incidentally, other common acids either don't work or aren't nearly as effective as phosphoric.

**Durene** (1,2,4,5-tetramethylbenzene) is of great commercial interest as a raw material for making polybasic acids. Making it from petroleum is frequently expensive, because durene content in many petroleum fractions is low and requires involved unit operations combinations to separate it. Pseudocumene is present in moderate concentrations in petroleum streams and can be easily distilled off, so large amounts are available at low cost. Amoco's new method for direct synthesis of durene from pseudocumene may be an answer to inexpensive durene manufacture.