Abstract
Process Economics Program Report 244
STRATEGIC BUSINESS UNITS OF EPOXY AND POLYCARBONATE RESINS
(June 2002)

This report presents economics for three of strategic business units (SBUs) for the production of polycarbonate and epoxy resins. The SBU is an integrated operation, which combines the production of the resin with the production of its respective precursor(s). The determination of the configuration of each SBU is based on the information of worldwide production capacities for the resins and their precursors. The latter includes bisphenol A (BPA) and diphenyl carbonate (DPC) for polycarbonate, and epichlorohydrin (ECH) and BPA for epoxy resins.

This report also presents review of technology and economics of the processes for the production of these precursors and the resins as listed below.

The processes for precursors
- ECH from propylene by chlorination and dehydrochlorination.
- BPA from phenol and acetone by improved cation exchange resin process
- DPC from phenol and DMC, which is prepared by oxidative carbonylation, by reactive distillation
- DPC from phenol by direct phosgenation
- DPC from phenol by oxidative carbonylation.

The processes for the resins
- Polycarbonate by interfacial process with on-site production of phosgene
- Polycarbonate by integrated melt process with DPC prepared from phenol and DMC, which is prepared by oxidative carbonylation of methanol
- Polycarbonate by integrated melt process with DPC prepared by direct phosgenation
- Polycarbonate by integrated melt process with DPC prepared by oxidative carbonylation
- Diglycidyl ether of bisphenol A (DGEBA) from BPA and ECH
- Solid Epoxy Resin from DGEBA and BPA by advancement process
- High molecular weight (MW) epoxy solution from DGEBA and BPA in MEK solvent.

The demand for polycarbonate in 2001 is estimated at 1.8 million metric tons of which 40% is accounted for by Asian consumption, more than 30% by the consumption of North America, and 22% by the consumption of Western Europe. The demand for epoxy resins in 2001 is estimated at 1.2 million metric tons, of which 48% is accounted for by Asian consumption, more
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