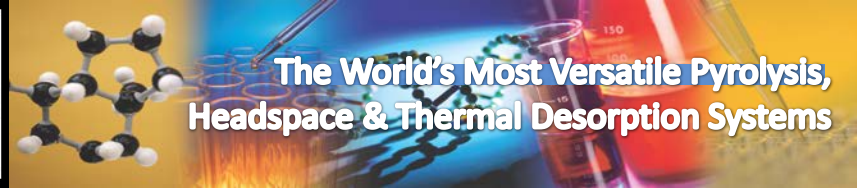
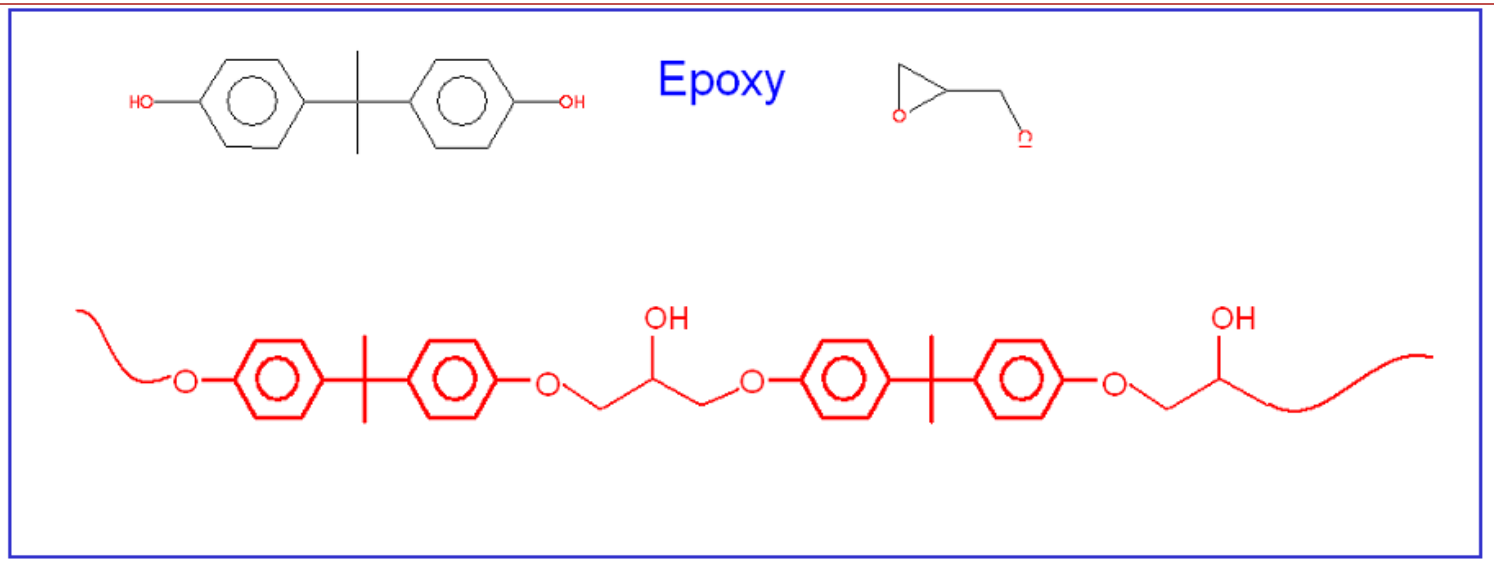


Pyro 2012, Linz

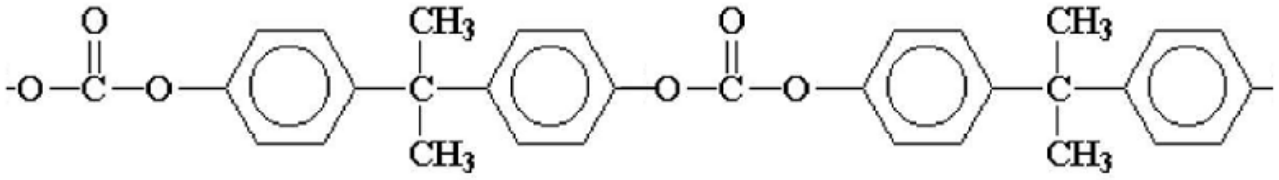
COMPARING THE PYROLYSIS BEHAVIORS OF EPOXIES AND POLYCARBONATES

Tom Wampler, Karen Jansson
CDS Analytical, 465 Limestone Road, Oxford, PA 19363

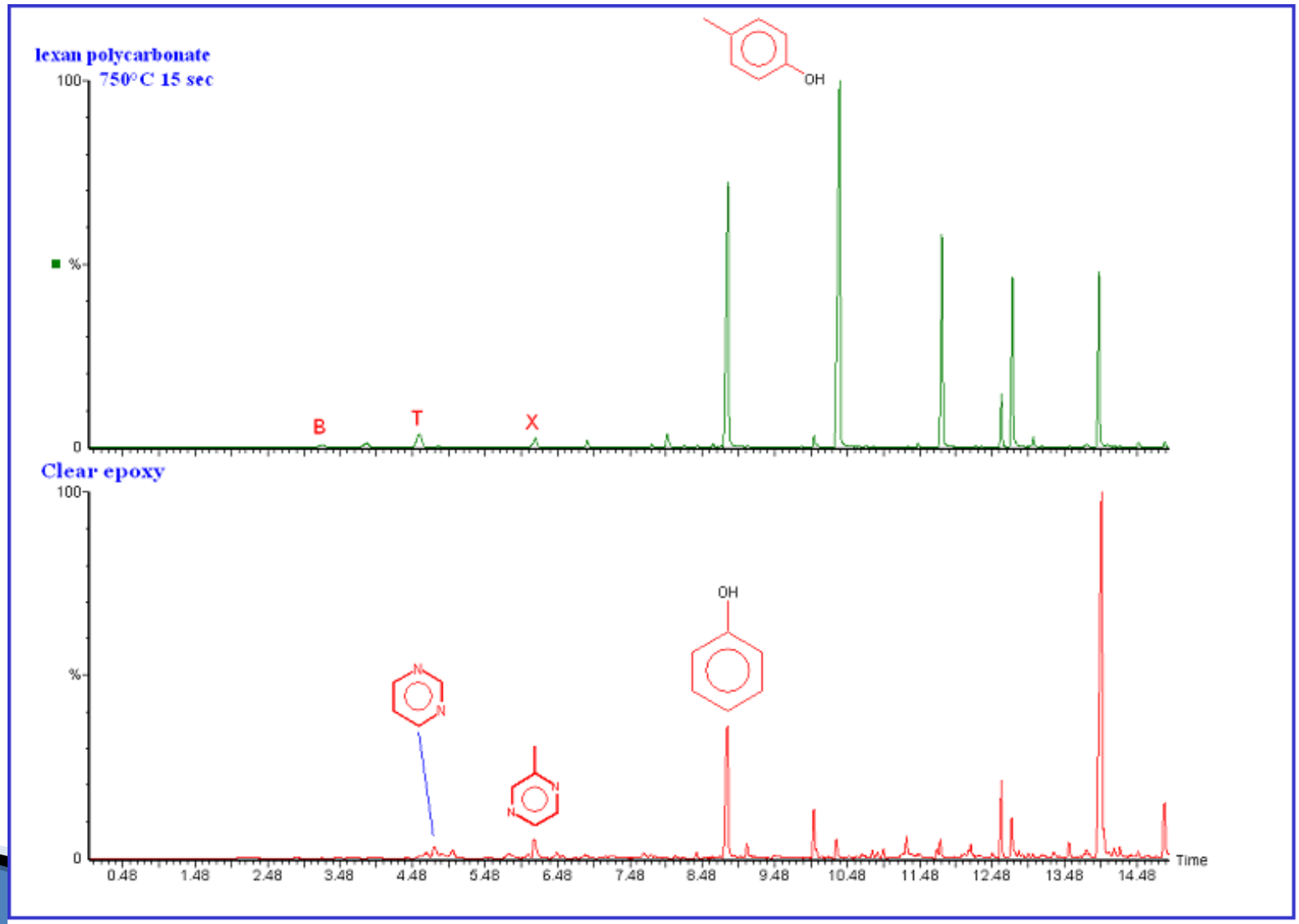
BPA polymer structures



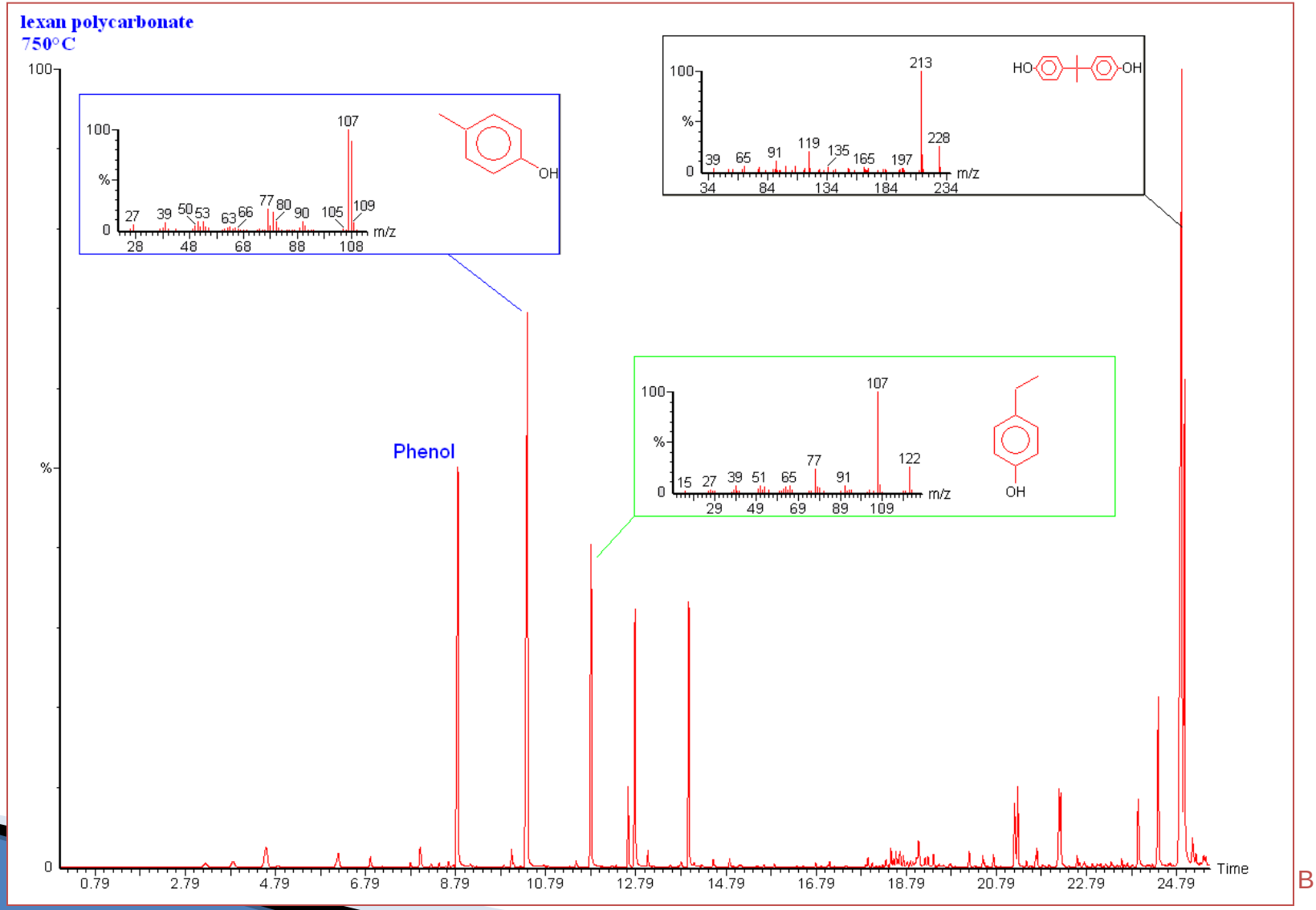
POLYCARBONATE



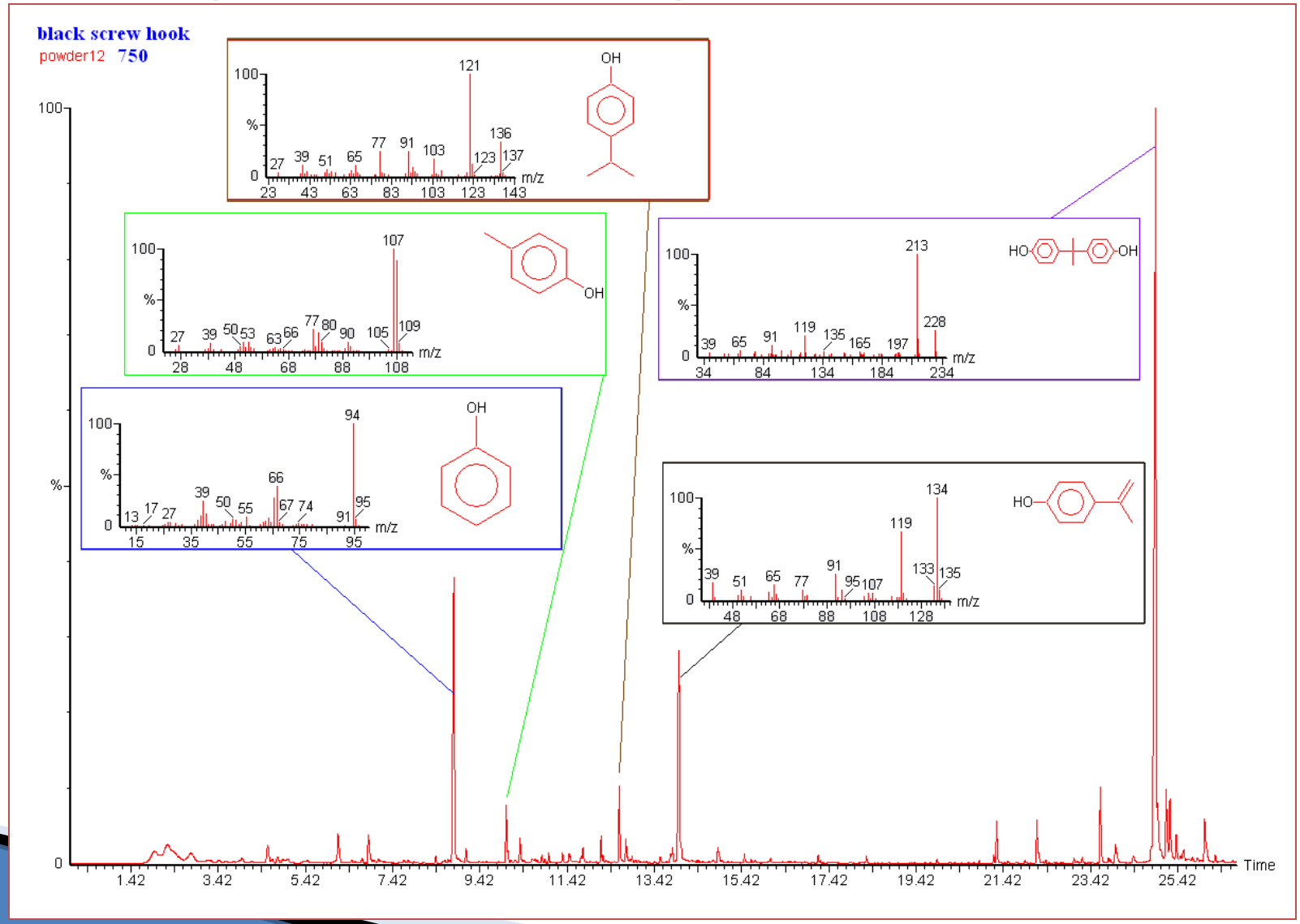
Pyrolysis of Polycarbonate and Epoxy



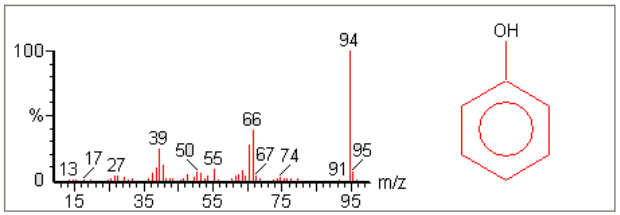
Py-GC/MS of polycarbonate

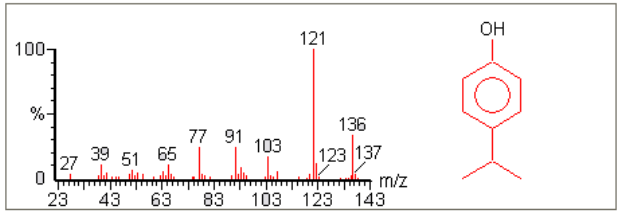


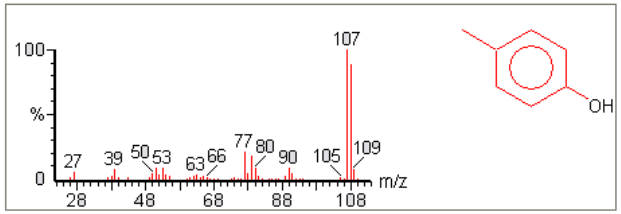
Py-GC/MS of powder coat

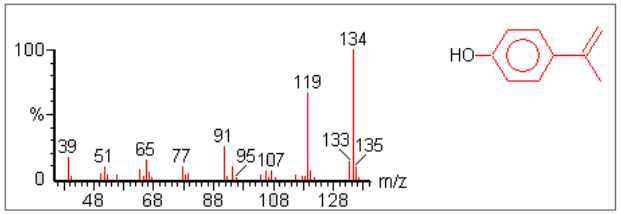


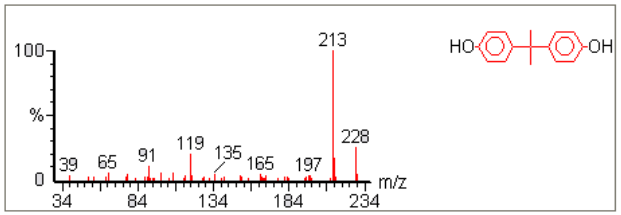
Phenolics and mass spectra

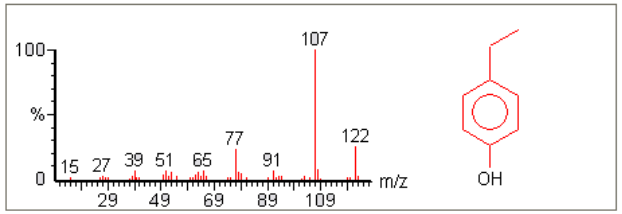


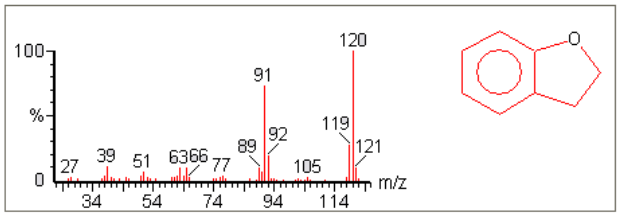


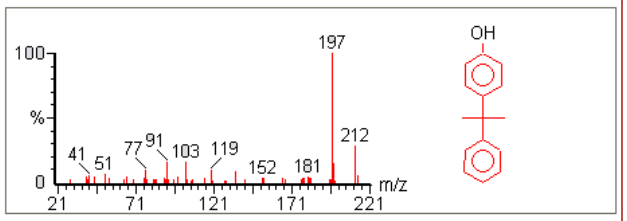






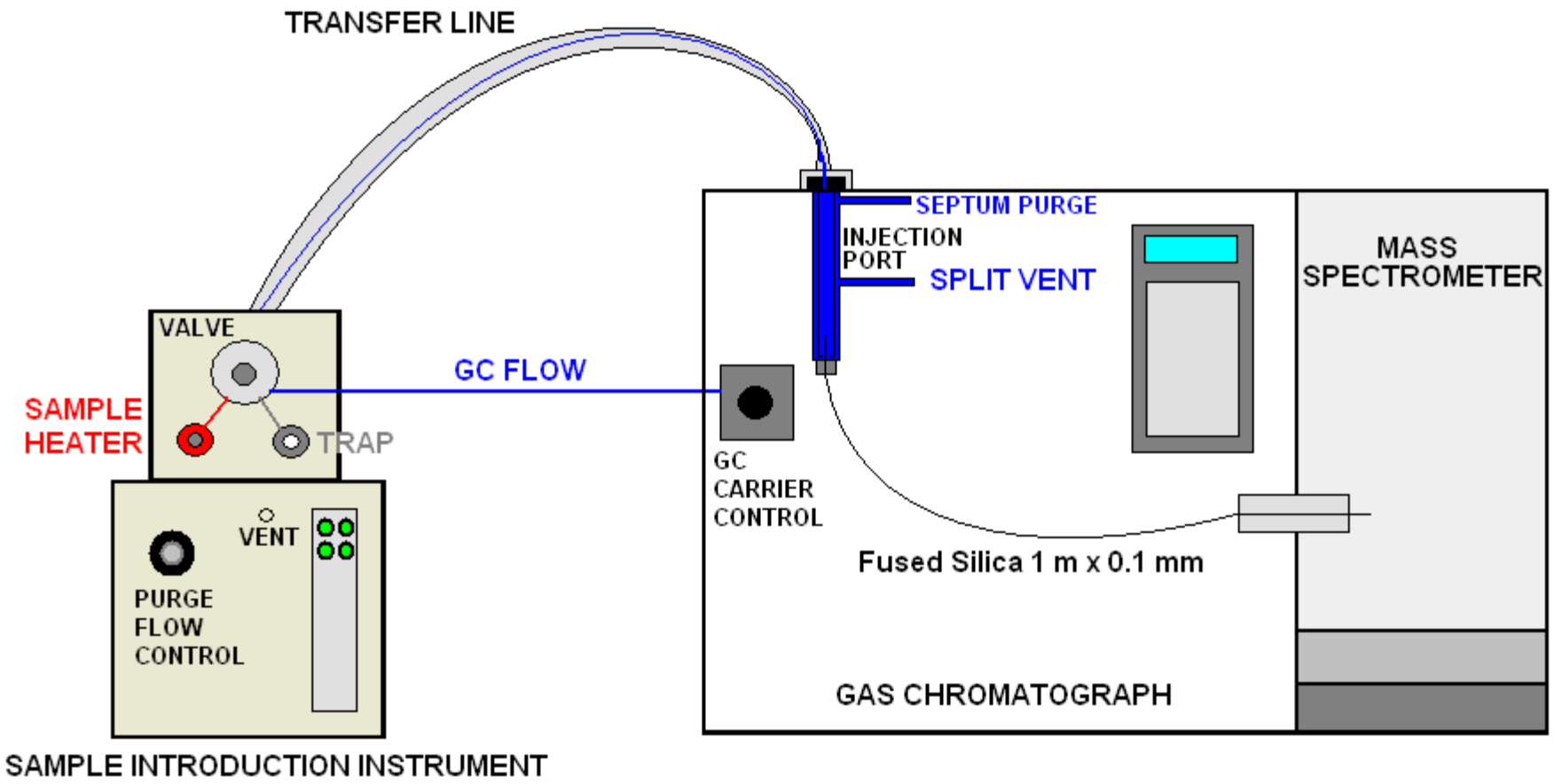






PHENOL 94
METHYL PHENOL 107
ETHYL PHENOL 107, 122
ISOPROPYL PHENOL 121, 136
ISOPROPENYL PHENOL 119, 134
BISPHENOL A 213, 228

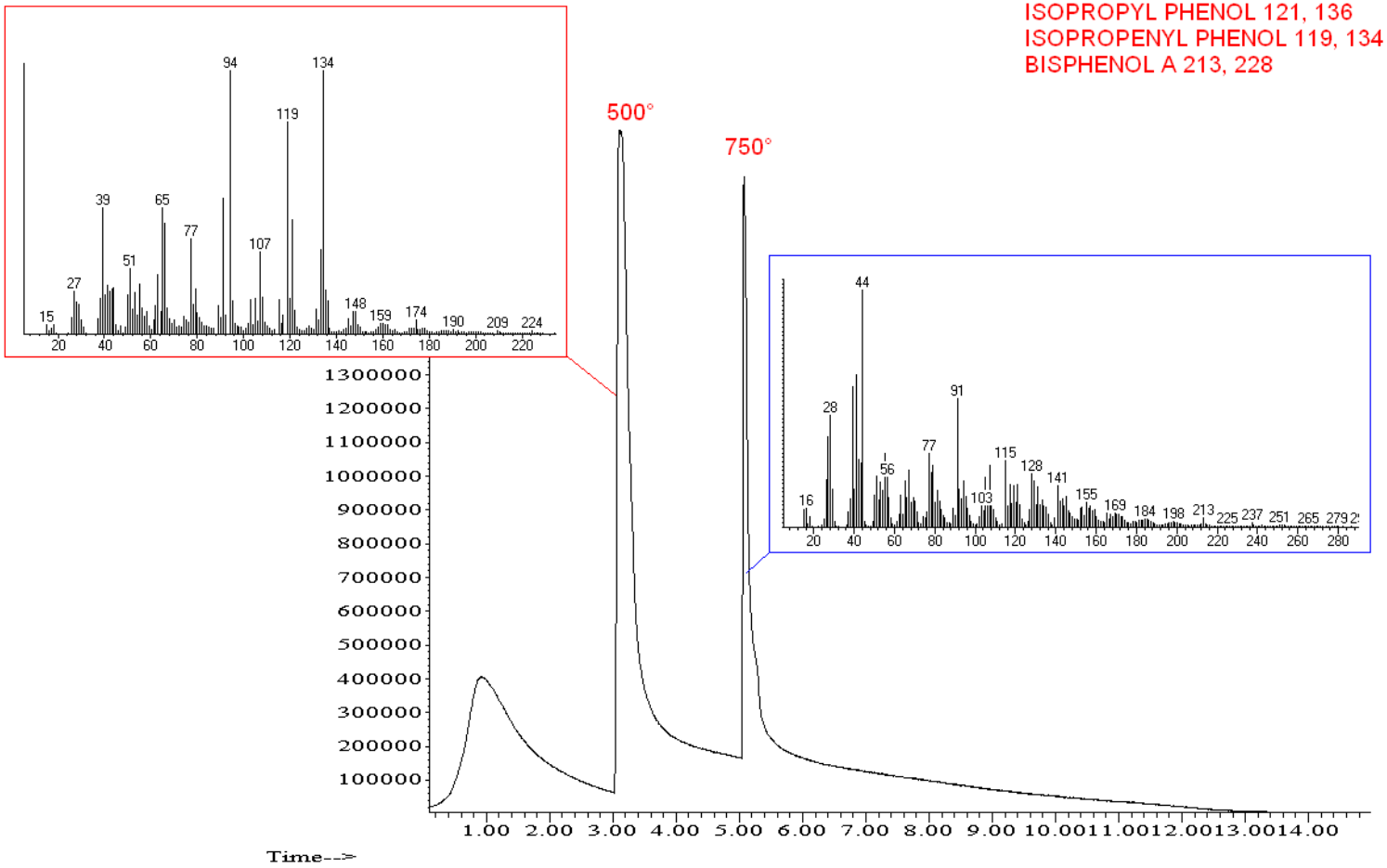
Pyrolysis to Mass Spec



Three-step analysis of epoxy to MS

EPOXY AT 300°, 500° AND 750°C
DIRECT TO MS

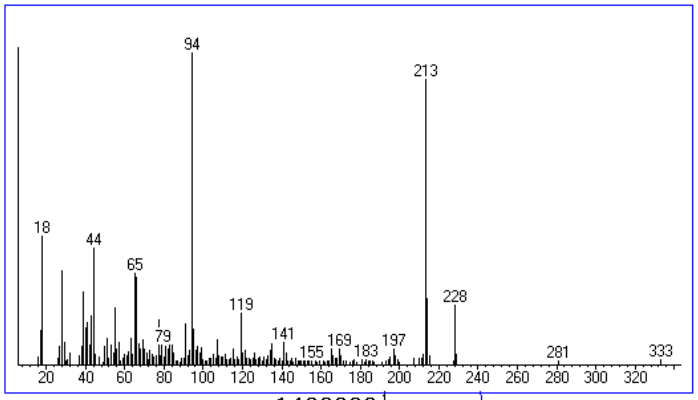
PHENOL 94
METHYL PHENOL 107
ETHYL PHENOL 107, 122
ISOPROPYL PHENOL 121, 136
ISOPROPENYL PHENOL 119, 134
BISPHENOL A 213, 228

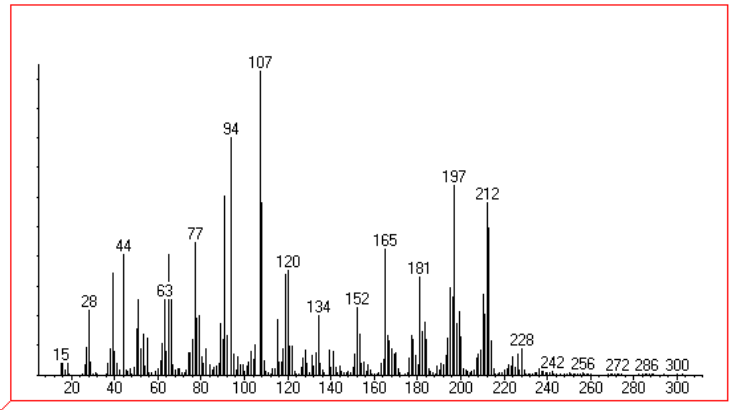


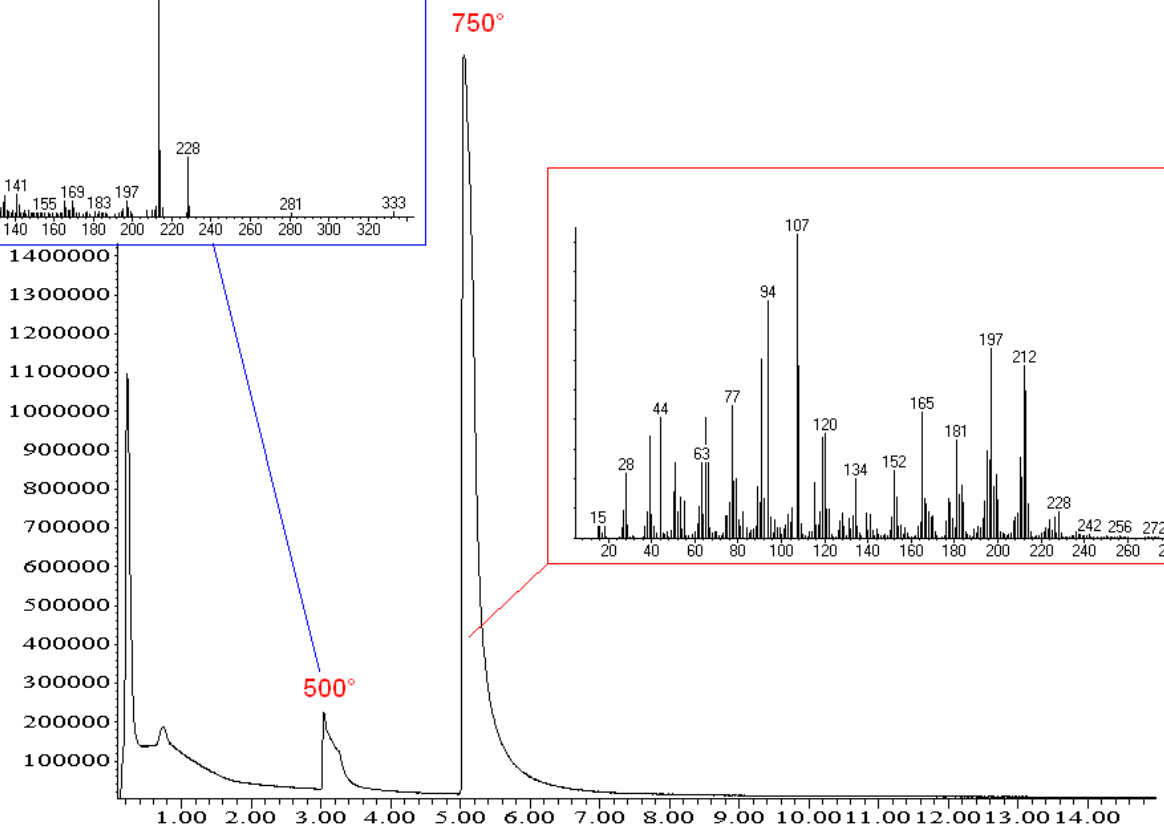
Three-step analysis of Polycarbonate

Polycarbonate at 300°, 500° and 750°C
Direct to MS

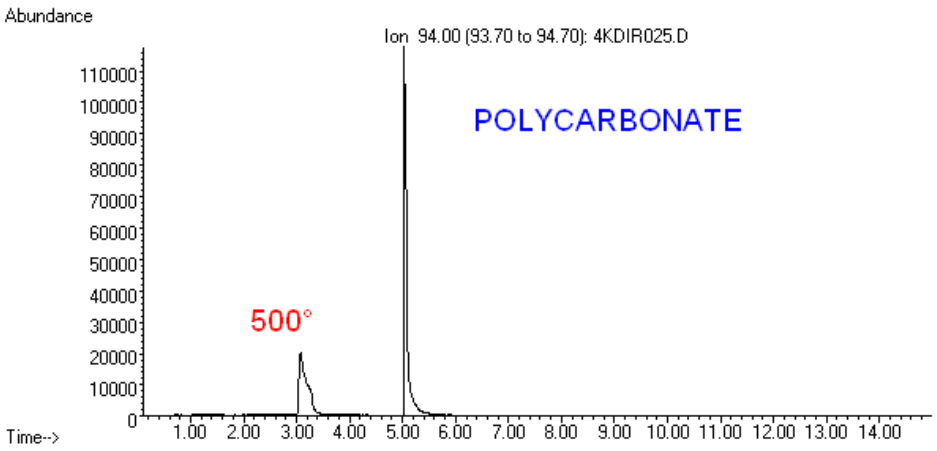
PHENOL 94
METHYL PHENOL 107
ETHYL PHENOL 107, 122
ISOPROPYL PHENOL 121, 136
ISOPROPENYL PHENOL 119, 134
BISPHENOL A 213, 228

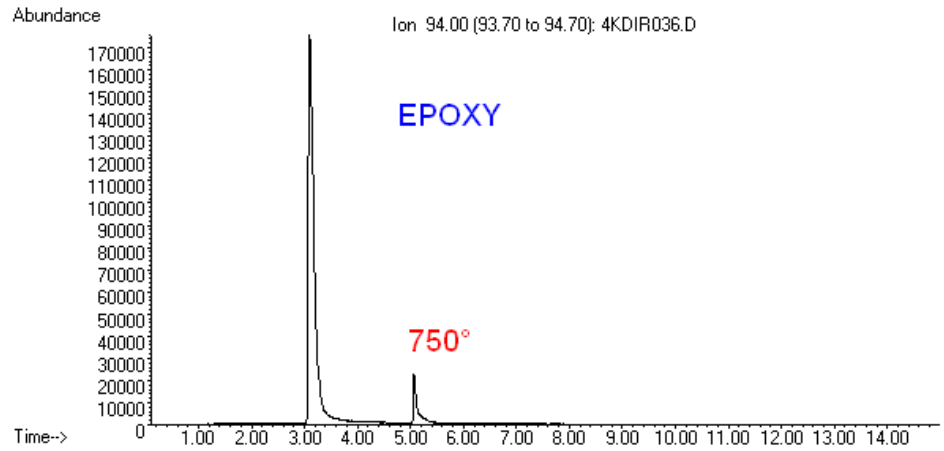




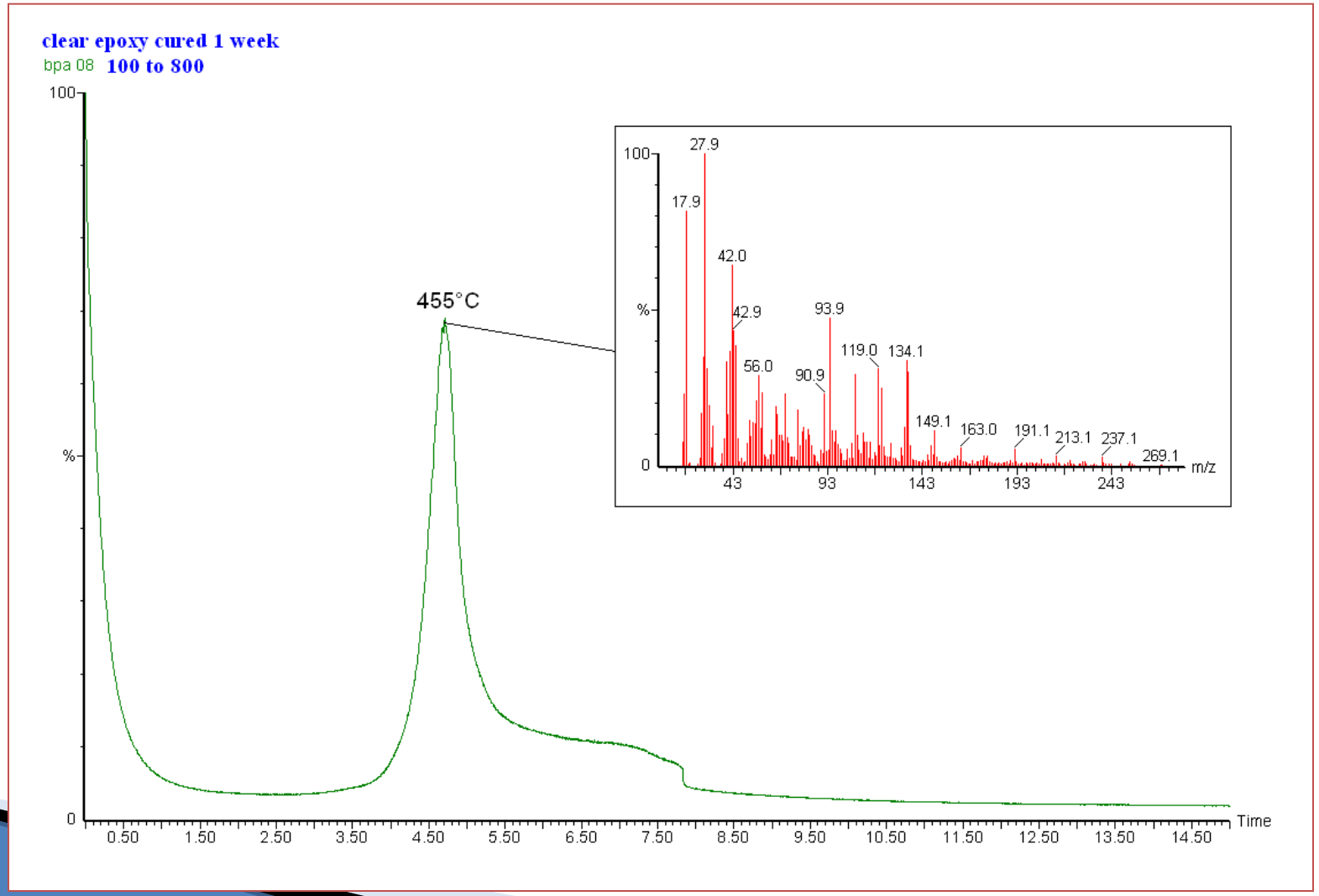


Ion 94 for phenol

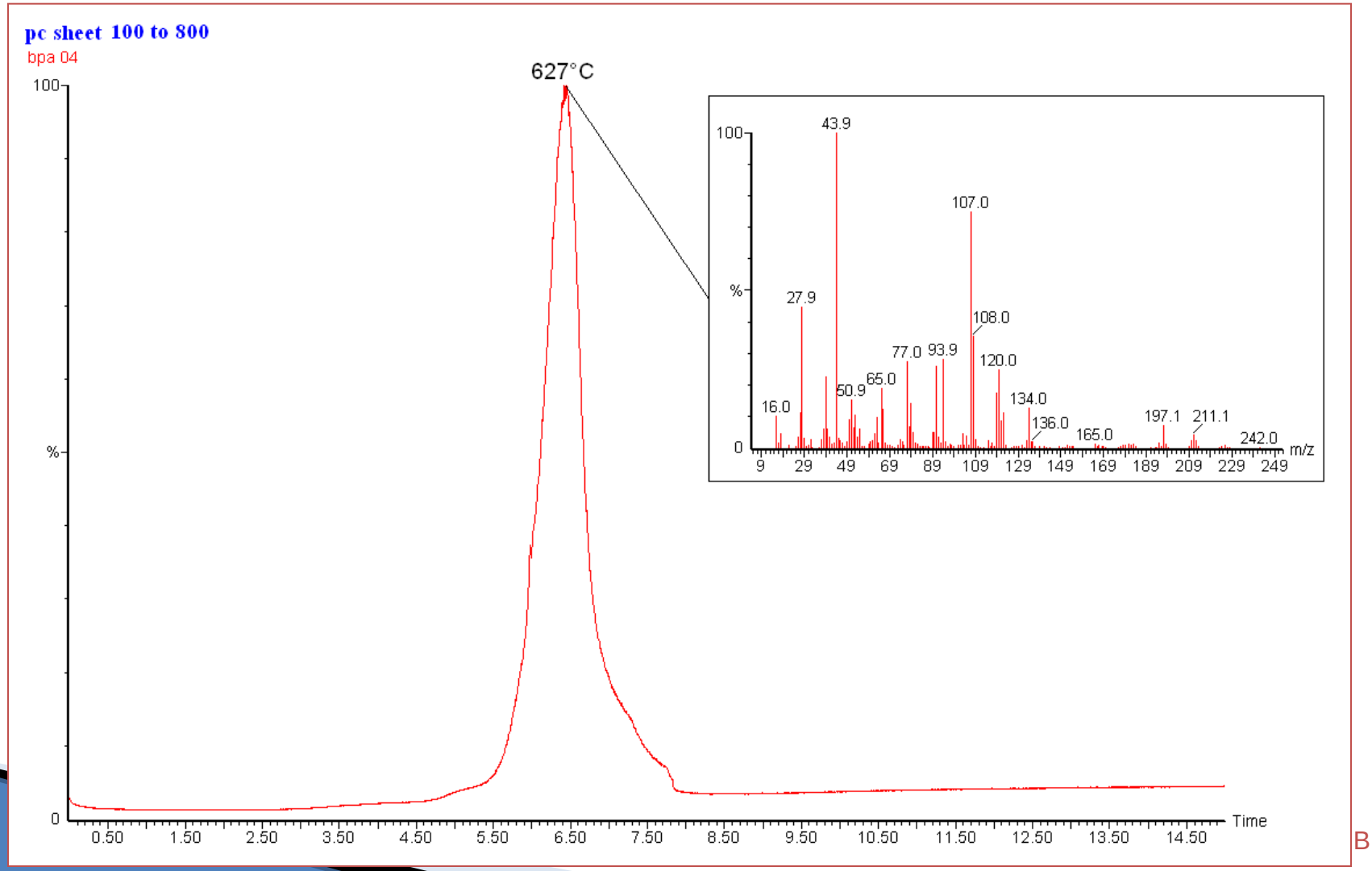




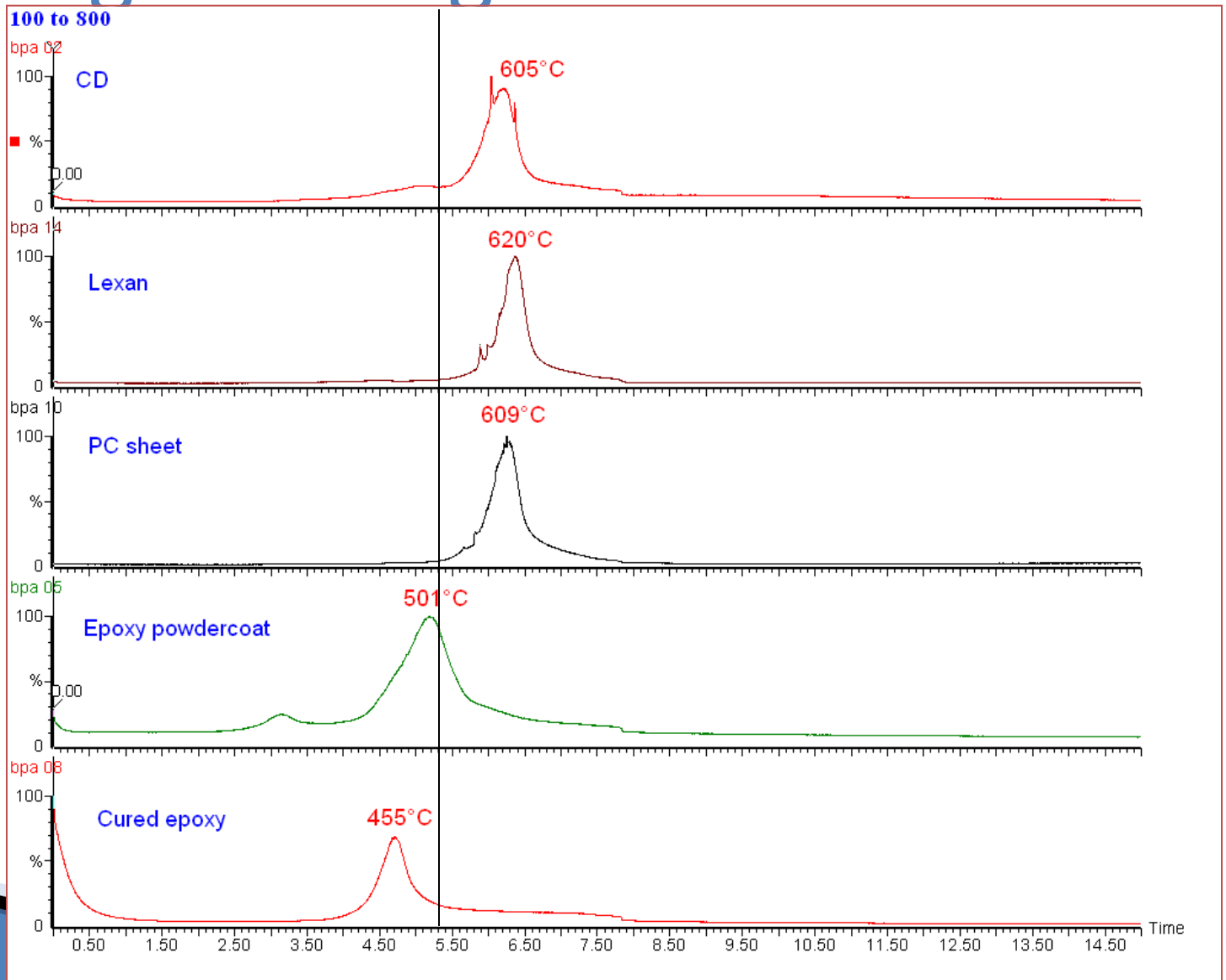
Epoxy programmed at 100°/minute to MS



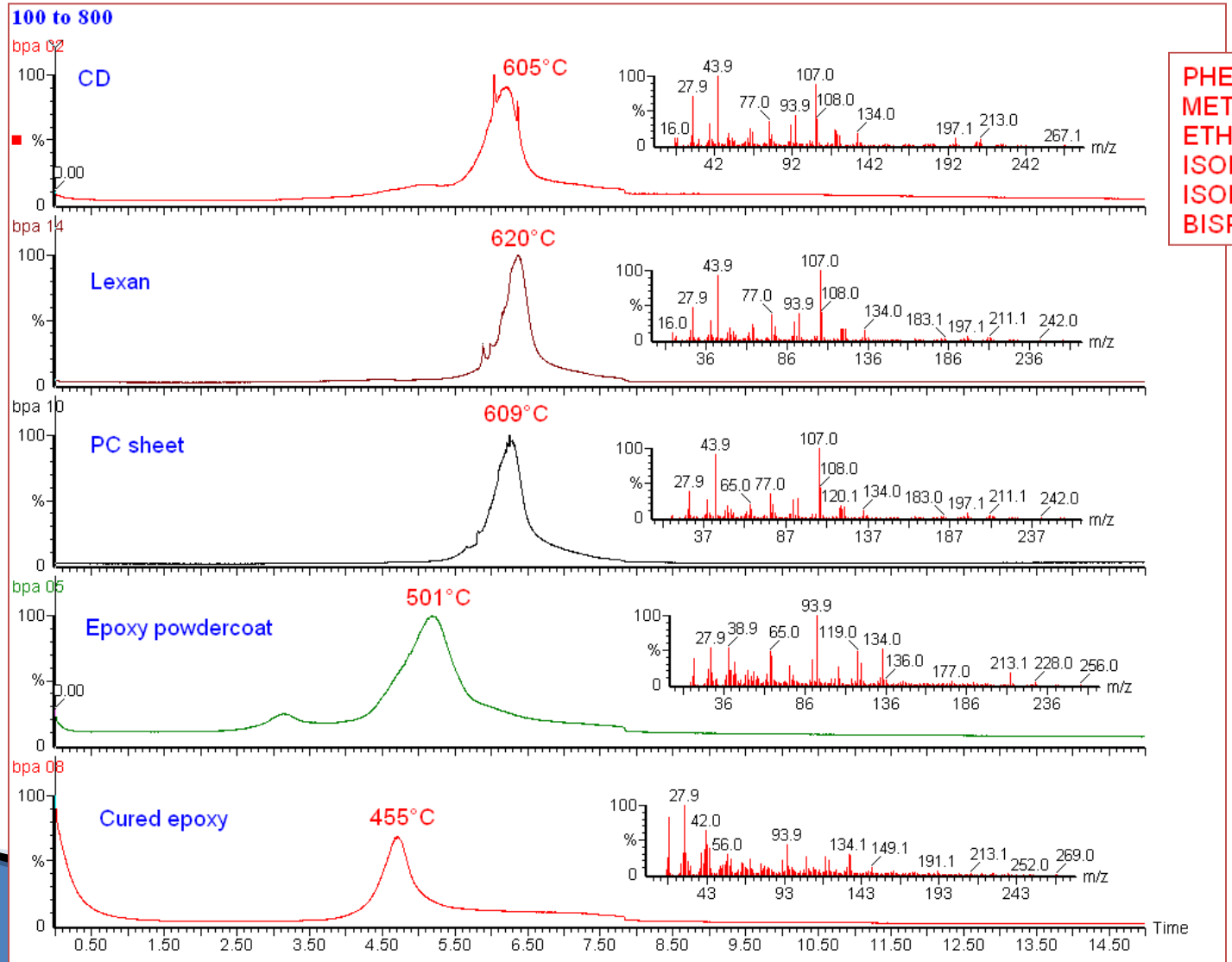
Polycarbonate at 100°C/minute to 800°C



Programming from 100 to 800°C

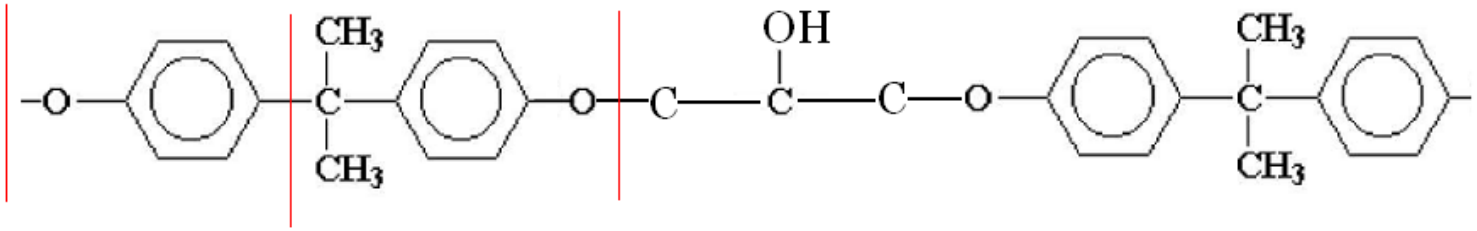


Programming from 100 to 800°C

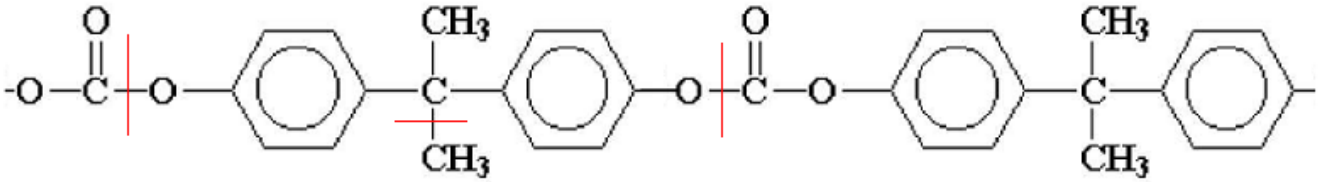


PHENOL 94
METHYL PHENOL 107
ETHYL PHENOL 107, 122
ISOPROPYL PHENOL 121, 136
ISOPROPENYL PHENOL 119, 134
BISPHENOL A 213, 228

Bond Scission

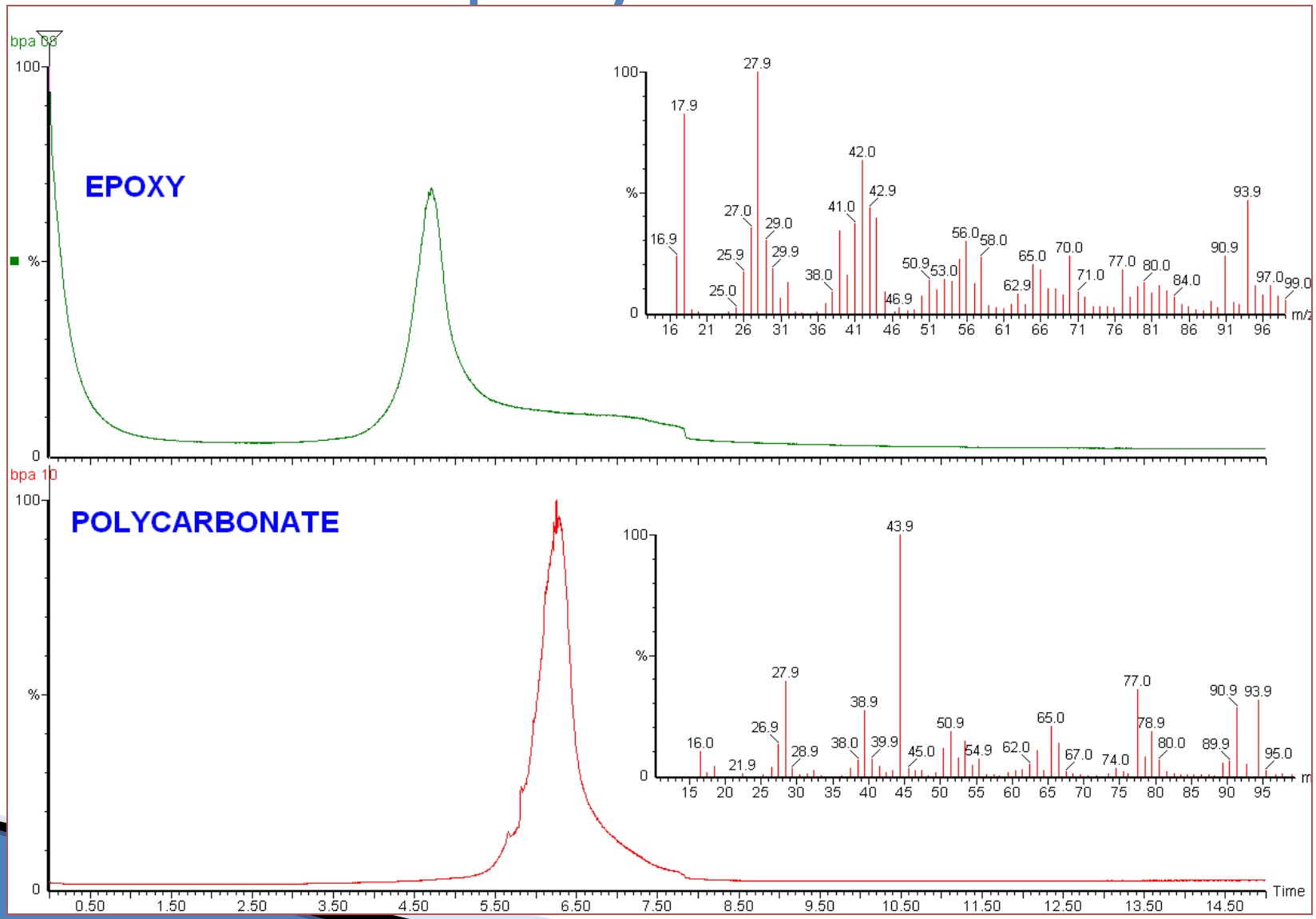


EPOXY

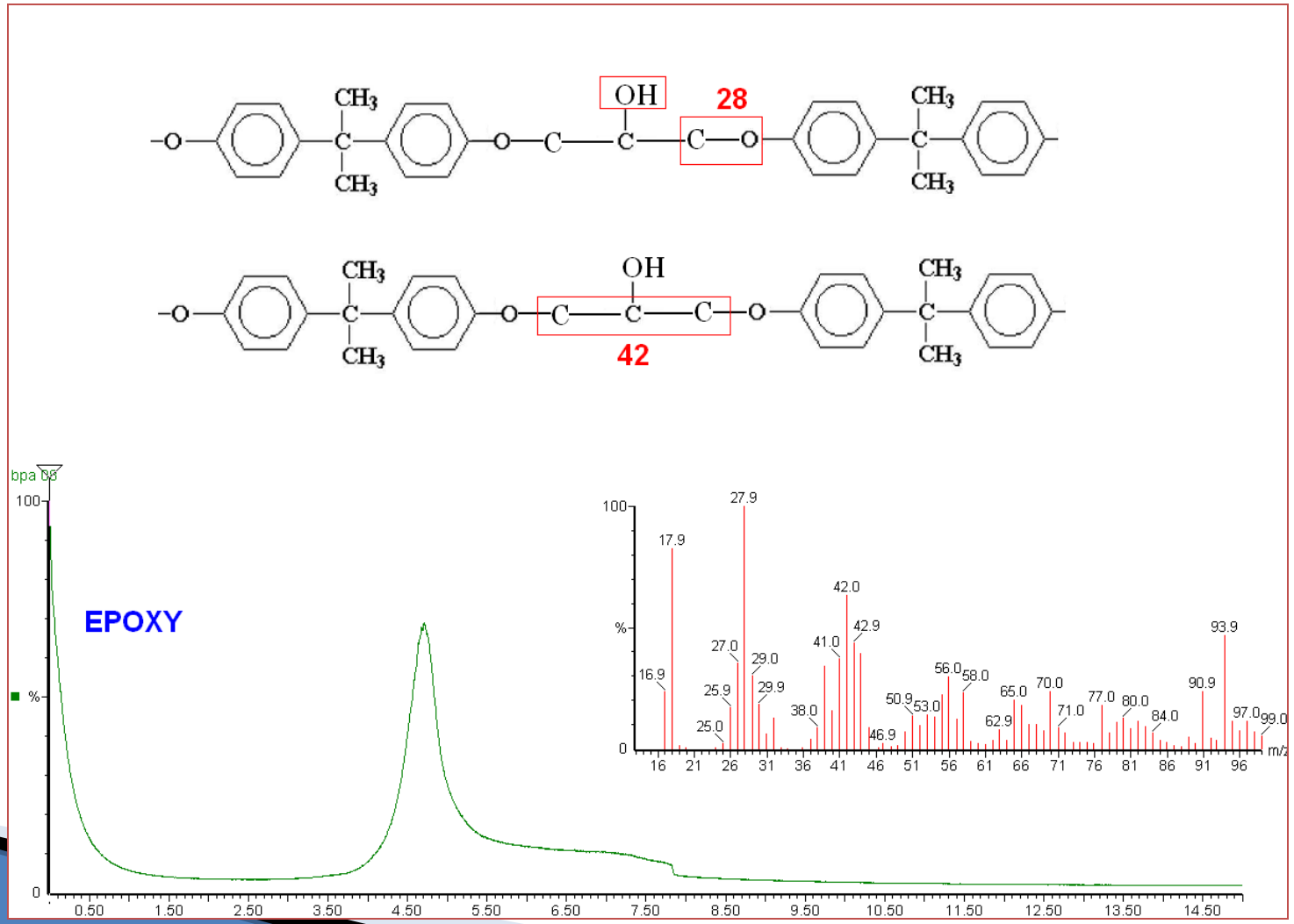


POLYCARBONATE

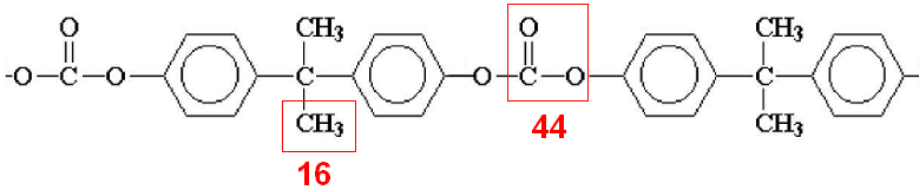
Epoxy and PC

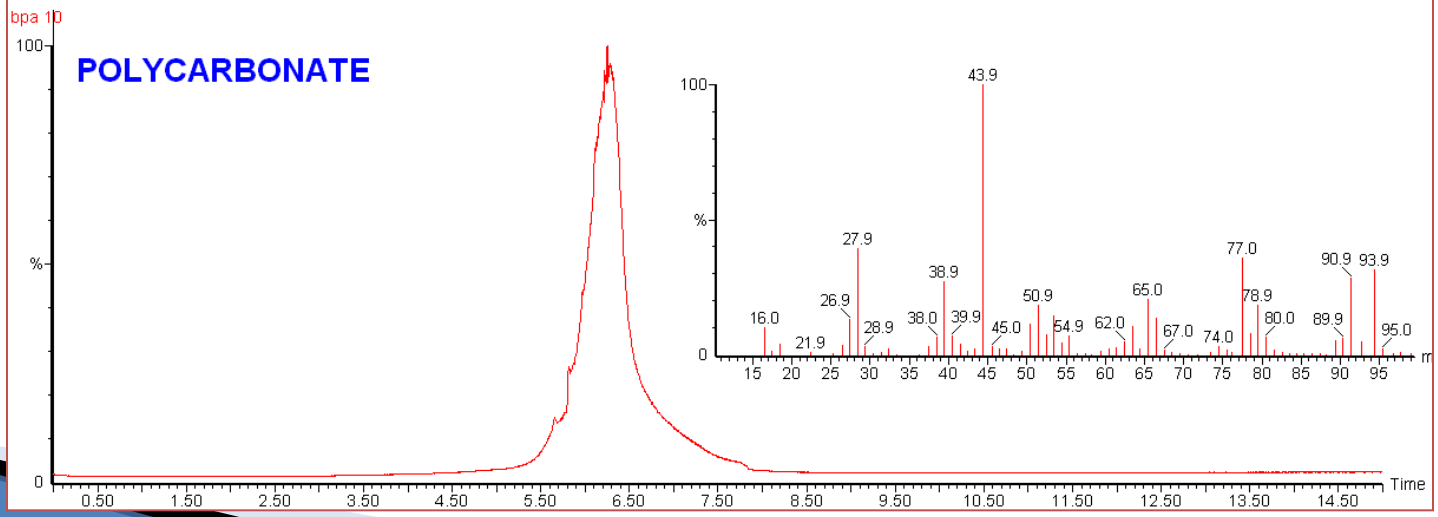


Small molecules from epoxy

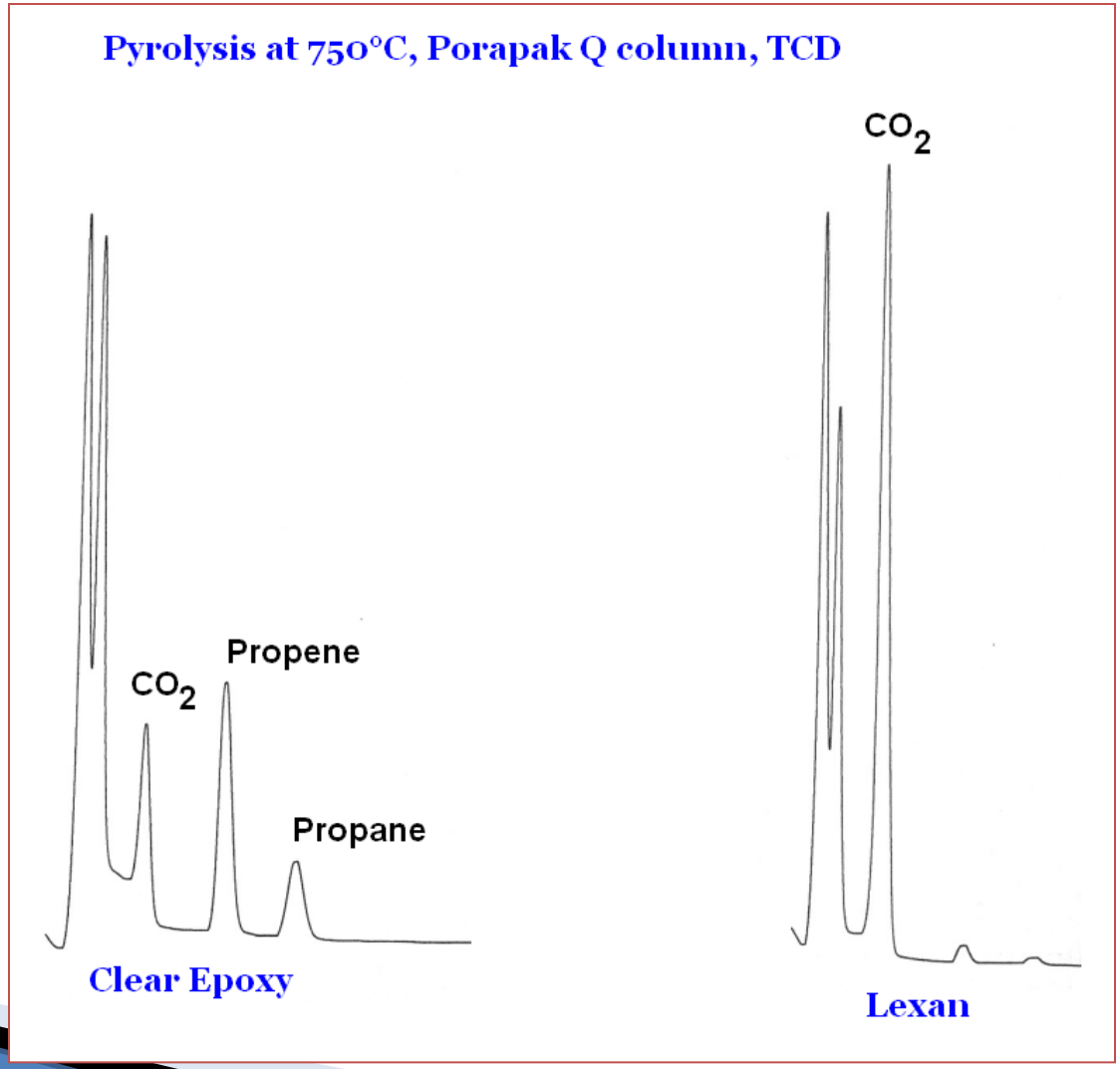


Small molecules from PC



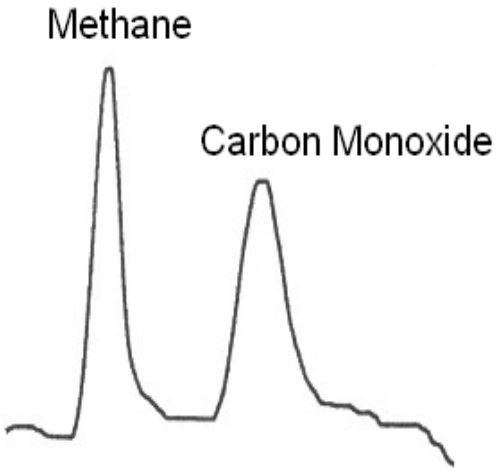


Pyrolysis-GC/TCD

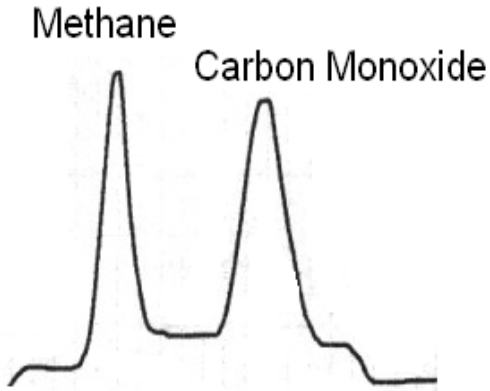


Pyrolysis-GC/TCD

Pyrolysis at 750°C to Molecular Sieve column, TCD



Clear Epoxy



Lexan PC

Conclusions