

-50°C., from which it is
 press, be it retardation or
 tion.

zation of the amorphous
 he dihydrate (Fig. 7), a
 .³ At room temperature
 y low conversion (2-3%);
 reaction to complete con-
 t would be that applied
 o simulate the conditions
 oval of defects. Such an
 the crystalline monomers

under pressure may be related to the known effects of high pressure on the
 polymerization of liquid monomers.

Pressure Dependency

Further evidence in support of the above theory derives from a study of
 the effect of lower pressures. The pressure required to maintain a uni-
 formly high yield of polymer at high conversion is less in the case of amor-
 phous calcium acrylate than for the crystalline monomer; for the former a
 sharp pressure transition exists between 5000 psi for which the yield is the
 same as for an unpressurized polymerization. Above 10,000 psi the yield is
 constant up to our working limit of 90,000 psi. The crystalline salt ex-
 hibits an almost linear relationship for polymer yield with pressure above a
 minimum close to 23,000 psi.

TABLE II
 Effect of Temperature on In-Source Polymerizations

Monomer	Irradiation dose $\times 10^6$ r	Temperature, °C.	Applied pressure, psi	% conversions
Acrylamide	0.97	19	0	4
	0.97	19	90,000	2
	0.97	80	0	76
	0.97	80	90,000	77
Methacrylamide	3.94	19	0	2
	3.94	19	90,000	0.4
	3.94	80	0	26
	3.94	80	90,000	5
	3.94	100	0	80
	3.94	100	90,000	21
Calcium acrylate (crystalline dihydrate)	0.47	19	0	2.5
	0.47	19	90,000	13
	0.47	80	0	3
	0.47	80	90,000	81
	0.47	100	0	34
	0.47	100	90,000	72
Barium methacrylate (crystalline anhydrate)	5.45	19	0	1.3
	5.45	19	90,000	3.1
	5.45	80	0	2.8
	5.45	80	90,000	1.5
	5.45	100	0	1.4
	5.45	100	90,000	1.4
		E 15 psi kcal./mole	E 90,000 psi kcal./mole	
Acrylamide		14	17	
Methacrylamide		10	5	

1.0

amide and methacrylamide
 acid salts propagate only in
 polymerization of acrylic
 containing discontinuities,
 e to the movement of dis-
 hile this might be a feasible
 rs polymerized just below
 the same explanation can
 melting points, even at the
 creased rate for the amor-
 basis of our introductory
 treme case of a randomly
 he liquid phase. The fact
 gation reaction only exists