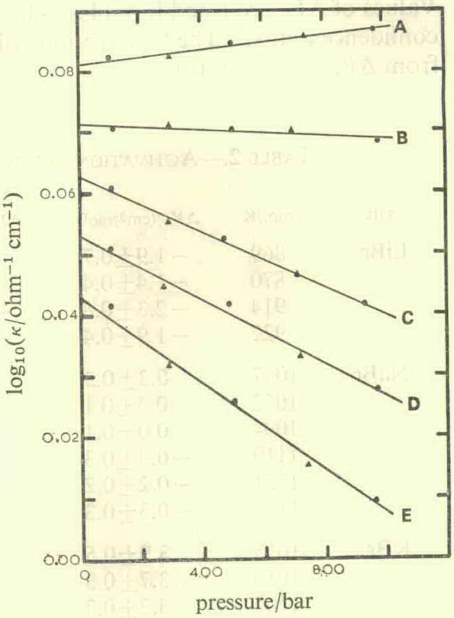

FIG. 5.—Isothermal plots of $\log_{10}$(conductivity) against pressure for fused alkali metal iodides. The isotherms have been positioned arbitrarily on the log κ axis. A, LiI at 798 K; B, NaI at 1053 K; C, KI at 1069 K; D, RbI at 1071 K; E, CsI at 1075 K. ●, increasing pressure; ▲, decreasing pressure.

TABLE 1.—ACTIVATION VOLUMES AND ENERGIES FOR FUSED CHLORIDES

salt	temp./K	ΔV_κ/(cm^3/mol)	ΔV_Λ/(cm^3/mol)	$(E_\Lambda)_P$/(J/mol)	$(E_\Lambda)_V$/ (J/mol)	$(E_\Lambda)_V$/ $(E_\Lambda)_P$
LiCl	916	-2.4 ± 0.6	-0.8 ± 0.6	8440 [a]	8560	1.01
	921	-1.5 ± 0.3	0.1 ± 0.3			
	921	-2.2 ± 0.4	-0.6 ± 0.4			
	968	-1.2 ± 0.7	0.5 ± 0.7			
	973	-1.4 ± 0.7	0.4 ± 0.7			
NaCl	1098	0.3 ± 1.2	3.0 ± 1.2	10 590 [b]	5960	0.56
	1133	1.1 ± 2.9	4.1 ± 2.9	9 300 ± 800 [c]		
KCl	1065	2.9 ± 0.2	6.3 ± 0.2	14 110 [b]	7310	0.52
	1093	2.7 ± 0.1	6.2 ± 0.1	14 000 ± 5700 [c]		
	1129	2.2 ± 0.1	6.2 ± 0.1			
RbCl	1009	4.1 ± 0.4		15 680 [b]	8020	0.51
	1045	4.3 ± 0.3		16 400 ± 1900 [c]		
	1070	4.0 ± 0.5	8.0 ± 0.5			
	1114	4.1 ± 1.5				
CsCl	944	6.1 ± 0.3	9.3 ± 0.3	16 740 [b]	8490	0.51
	983	5.8 ± 0.3	9.4 ± 0.3	15 800 ± 1500 [c]		
	1034	4.5 ± 1.0	8.6 ± 1.0			
	1074	4.5 ± 0.3	9.1 ± 0.3			
	1129	4.4 ± 0.6	9.7 ± 0.6			
AgCl	745	1.1 ± 0.1	1.7 ± 0.1	5130 [d]	2780	0.54
	755	0.9 ± 0.1	1.5 ± 0.1	4 700 ± 540 [c]		
	774	0.9 ± 0.2	1.5 ± 0.2			

[a] ref. (12); [b] ref. (13), (14); [c] this work; [d] ref. (15).

Values of ΔV_κ are listed in tables 1-3. The uncertainties quoted correspond to 95 % confidence limits. The " activation volume " ΔV_Λ, defined by eqn (1), was calculated from ΔV_κ using eqn (6),

$$\Delta V_\Lambda = \Delta V_\kappa + \beta RT. \tag{6}$$

TABLE 2.—ACTIVATION VOLUMES AND ENERGIES FOR FUSED BROMIDES

salt	temp./K	ΔV_κ/(cm³/mol)	ΔV_Λ/(cm³/mol)	$(E_\Lambda)_P$/(J/mol)	$(E_\Lambda)_V$/(J/mol)	$(E_\Lambda)_V/(E_\Lambda)_P$
LiBr	869	-1.9 ± 0.7	-0.3 ± 0.7	8 860 [a]	9060	1.02
	870	-1.4 ± 0.4	0.2 ± 0.4	9 850±800 [c]		
	914	-2.3 ± 0.8	-0.5 ± 0.8			
	922	-1.9 ± 0.4	-0.1 ± 0.4			
NaBr	1047	0.3 ± 0.3	3.1 ± 0.3	9 920 [b]	6410	0.65
	1062	0.3 ± 0.1	3.2 ± 0.1	9 800±700 [c]		
	1094	0.0 ± 0.1	3.1 ± 0.1			
	1119	-0.3 ± 0.3	3.0 ± 0.3			
	1131	-0.2 ± 0.2	3.2 ± 0.2			
	1145	-0.3 ± 0.3	3.2 ± 0.3			
KBr	1015	3.9 ± 0.5	7.2 ± 0.5	15 580 [b]	8350	0.54
	1050	3.7 ± 0.3	7.4 ± 0.3	15 100±4 800 [c]		
	1105	3.2 ± 0.3	7.5 ± 0.3			
RbBr	988	5.5 ± 0.5		15 500 [b]	7930	0.51
	999	5.2 ± 0.5		13 300±2 700 [c]		
	1008	5.0 ± 0.5				
	1075	4.3 ± 0.5	9.1 ± 0.5			
	1122	3.8 ± 0.4				
CsBr	956	6.3 ± 0.4	10.6 ± 0.4	16 410 [b]	8880	0.54
	1002	5.7 ± 0.1	10.6 ± 0.1	15 500±700 [c]		
	1069	5.5 ± 0.3	11.5 ± 0.3			
	1098	5.2 ± 0.1	11.6 ± 0.1			
	1128	5.1 ± 0.6	12.1 ± 0.6			
AgBr	727	0.7 ± 0.2	1.3 ± 0.2	4 620 [d]	2840	0.61
	753	0.6 ± 0.2	1.2 ± 0.2	4 680±200 [c]		
	791	0.5 ± 0.5	1.2 ± 0.5			
	813	0.4 ± 0.2	1.2 ± 0.2			
	850	0.6 ± 0.5	1.5 ± 0.5			

[a] ref. (12); [b] ref. (13), (14); [c] this work; [d] ref. (16).

ΔV_Λ is independent of temperature within experimental error. We define " activation energies " corresponding to constant pressure and constant volume conditions by eqn (7),

$$(E_\Lambda)_P = -R[\partial \ln \Lambda/\partial(1/T)]_P;$$
$$(E_\Lambda)_V = -R[\partial \ln \Lambda/\partial(1/T)]_V. \tag{7}$$

Using eqn (2), these energies are related by

$$(E_\Lambda)_V = (E_\Lambda)_P - T(\partial P/\partial T)_V \Delta V_\Lambda \tag{8}$$

$(E_\Lambda)_V$ was calculated for each salt. For the alkali halides other than CsCl and CsI, $(\partial P/\partial T)_V$ was calculated using eqn (3) and literature values of expansivity [9] and compressibility.[10, 11] The $(E_\Lambda)_P$ values used in eqn (8) were also taken from the literature. Values of ΔV_κ, ΔV_Λ, $(E_\Lambda)_P$, $(E_\Lambda)_V$ and $(E_\Lambda)_V/(E_\Lambda)_P$ are listed in tables 1-3.