Table 1. *Phosphor crystals*

Phosphor	Starting materials		Source		Preparative procedure(s)
	Host crystal	Impurity	Host	Impurity	
Low impurity KI:Tl for concentration study	Single crystal KI:Tl (0·1–0·2%)		Harshaw Chemical Co.		Melting (impurity dilution) and press fusing
0·8KI/0·2KBr:Tl	Single crystal KI:Tl and KBr:Tl		Harshaw Chemical Co.		Melting, press fusing
0·6KI/0·4KBr:Tl	Single crystal KI:Tl and KBr:Tl		Harshaw Chemical Co.		Melting, press fusing
0·4KI/0·6KBr:Tl	Single crystal KI:Tl and KBr:Tl		Harshaw Chemical Co.		Melting, press fusing
0·2KI/0·8KBr:Tl	Single crystal KI:Tl and KBr:Tl		Harshaw Chemical Co.		Melting, press fusing
NaCl:Tl	Single crystal NaCl	Chemically pure TlCl	Harshaw Chem. Co.	Fairmount Chem. Co.	Grinding press fusing
NaBr:Tl	Chemically pure NaBr	Chemically pure TlCl	Schaar Co.	Fairmount Chem. Co.	Melting, press fusing
CsBr:Tl	Single crystal CsBr:Tl		Harshaw Chemical Co.		None
RbBr:Tl	Chemically pure RbBr	Chemically pure TlCl	A.D. Mackay, Inc.	Fairmount Chem. Co.	Melting, press fusing
RbI:Tl	Chemically pure RbI	Chemically pure TlCl	A. D. Mackay, Inc.	Fairmount Chem. Co.	Melting, press fusing
NaCl:Pb	Single crystal NaCl	Chemically pure $PbCl_2$	Harshaw Chem. Co.	Allied Chem. and Dye	Melting, press fusing
NaBr:Pb	Chemically pure NaBr	Chemically pure $PbCl_2$	Schaar Co.	Allied Chem. and Dye	Melting, press fusing
NaI:Pb	Single crystal NaI	Chemically pure $PbCl_2$	Harshaw Chem. Co.	Allied Chem. and Dye	Grind together, press fusing
	Single crystal KCl:Pb		Dr. A. B. Scott, Oregon State College		None
KCl:Pb	Single crystal KCl	Chemically pure $PbCl_2$	Harshaw Chem. Co.	Allied Chem. and Dye	Melting, press fusing
KBr:Pb	Single crystal KBr	Chemically pure $PbCl_2$	Harshaw Chem. Co.	Allied Chem. and Dye	Melting, press fusing
KI:Pb	Single crystal KI	Chemically pure $PbCl_2$	Harshaw Chem. Co.	Allied Chem. and Dye	Melting, press fusing
RbCl:Pb	Chemically pure RbCl	Chemically pure $PbCl_2$	A. D. Mackay, Inc.	Allied Chem. and Dye	Grind together, press fusing
RbBr:Pb	Chemically pure RbBr	Chemically pure $PbCl_2$	A. D. Mackay, Inc.	Allied Chem. and Dye	Melting, press fusing
RbI:Pb	Chemically pure RbI	Chemically pure $PbCl_2$	A. D. Mackay, Inc.	Allied Chem. and Dye	Melting, press fusing Grind together, press fusing

Table 1. *Phosphor crystals*—(continued)

Phosphor	Starting materials		Source		Preparative procedure(s)
	Host Crystal	Impurity	Host	Impurity	
CsI:Pb	Single crystal CsI	Chemically pure $PbCl_2$	Harshaw Chem. Co.	Allied Chem. and Dye	Melting, press fusing
CsCl:Pb	Chemically pure CsCl	Chemically pure $PbCl_2$	Fisher Scientific Co.	Allied Chem. and Dye	Melting, press fusing
NH_4Br:Pb	Chemically pure NH_4Br	Chemically pure $PbCl_2$	Allied Chem. and Dye	Allied Chem. and Dye	Melting, press fusing
KCl:In	Single crystal KCl:In		Dr. F. E. Williams, General Electric Co.		None
KBr:In	Single crystal KBr	Chemically pure In	Harshaw Chem. Co.	A. D. Mackay, Inc.	Melting, press fusing
KBr:Bi	Single crystal KBr	Chemically pure $BiCl_3$	Harshaw Chem. Co.	Allied Chem. and Dye	Melting, press fusing
KCl:Cu	Single crystal KCl	Chemically pure $CuCl_2$	Harshaw Chem. Co.	Mallinkrodt Chem. Co.	Melting, press fusing
KBr:Cu	Single crystal KBr	Chemically pure $CuCl_2$	Harshaw Chem. Co.	Mallinkrodt Chem. Co.	Melting, press fusing

DISCUSSION

The effect of pressure on the Tl^+ *ion in alkali halide lattices*

The effect of pressure on the spectra of the *A* band in ten alkali halides activated with thallium has been measured to as high as 158,000 atm. In five cases (NaI:Tl, KCl:Tl, KBr:Tl, KI:Tl and CsI:Tl) the data have been reported previously.[13] The data on the other five phosphors (NaCl:Tl, NaBr:Tl, RbBr:Tl, RbI:Tl and CsBr:Tl) are shown in Fig. 1. For those phosphors which crystallize in the sodium chloride structure (face-centred cubic), the shift with increasing pressure is to lower energy. On the other hand, for those which crystallize in the cesium chloride structure (simple cubic), up to 15,000 atm a shift to higher energy is observed. At higher pressures the shift is to lower energy. A plot of the initial frequency shift vs. pressure for these crystals (see Fig. 2) reveals two important facts. In the first place, the shift is strongly dependent upon the crystal structure, or in other words, the impurity center is dependent upon the bulk crystalline field. On the other hand, no significant

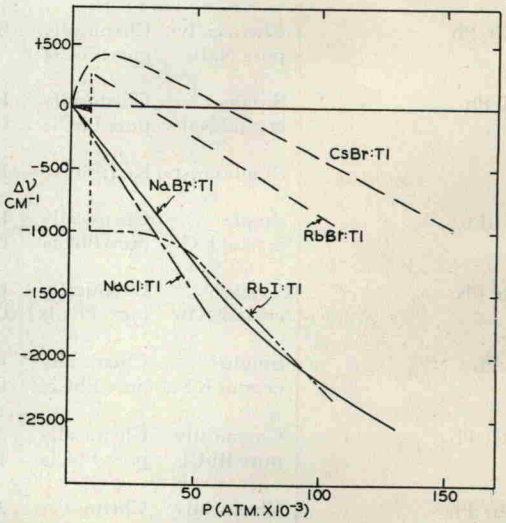

FIG. 1. "*A*" peak frequency vs. pressure—five alkali halides activated by Tl^+.

dependence upon the nearest neighbor halides is observed. For example, similar shifts are observed for KI:Tl, KBr:Tl and KCl:Tl. Thus the halide