

Table 5. Crystal structures chosen for model fits of four bond types. For each bond type, two crystal structures were chosen that had two different cation coordination numbers and very symmetrical cation coordination polyhedra (variations in bond lengths no more than a few hundredths of an Å). Thus, an average bond length could be accurately associated with the average (assumed) bond valence (the cation valence divided by the coordination number).

Bond	Crystal	R_{M-O} (avg.)	s_{ij} (assumed)	Source
Mg-O	MgO (Periclase)	2.112	0.333	(Hazen, 1976)
Mg-O	K ₆ MgO ₄	2.024	0.5	(Darriet et al., 1974)
Be-O	BeO (Bromellite)	1.651	0.5	(Hazen and Finger, 1986)
Be-O	RbNa ₅ Be ₈ O ₁₁	1.5603	0.667	(Schuldt and Hoppe, 1989)
Si-O	SiO ₂ (α-Quartz)	1.609	1.000	(Kihara, 1990)
Si-O	SiO ₂ (Stishovite)	1.758	0.667	(Smyth et al., 1995)
Ge-O	GeO ₂ (quartz-like)	1.739	1.000	(Yamanaka and Ogata, 1991)
Ge-O	GeO ₂ (Argutite)	1.888	0.667	(Bolzan et al., 1997)

Table 6. Summary of BV-distance model fits for the oxides in figure 4: three-parameter geometric hybrid (Eqn. 5), and four-parameter arithmetic hybrid (Eqn. 8) forms. The sum of squared error is also reported for both models.

Atom 1	Atom 2	Hybrid Geometric			Hybrid Arithmetic				Residual	
		w	B	R_0	w	Be	Bp	R_0	Hyb-G3	Hyb-A4
Mg	O	0.0000	0.1122	1.8428	0.0029	0.0029	0.1790	1.7659	0.3912	0.0023
Be	O	0.0000	0.1355	1.4504	0.0018	0.0129	0.2388	1.4086	0.0954	0.0005
Si	O	0.0000	0.1184	1.6344	0.0002	0.0140	0.2103	1.6196	0.0383	0.0028
Ge	O	0.0000	0.1273	1.7698	0.0001	0.0144	0.2038	1.7554	0.0315	0.0095