Anisotropic secondary extinction effects were measured and were strongest intensity for Al and for Si. This information can no longer be retrieved in the data reduction process. Both sets of reduced data were free of term from extinction, and were used in an absolute scale. X-ray diffraction intensities from MoKα radiation were reduced by kinematic theory to structure factors; for corundum a secondary extinction model was included in the data reduction process. Both sets of reduced data are on a relative scale. Phases for the data sets were determined from a pseudoatom refinement model. The structure factors on an absolute scale were based on the generalized x-ray form factors of SiO2 and Al2O3. Deformation electrostatic potential maps, constructed by Fourier summation methods of the phased x-ray structure factors, were free from termination artifacts. The electrostatic potential difference maps reveal features of chemical bonding. The electro-positive region on the exposed side of Si in the quartz structure somewhat resembles electro-positive regions found in elemental Si. Electro-negative regions are found around the oxygens and are polarized towards the near neighbor Si atoms. By contrast, the electro-negative region about the Al atoms in Al2O3 has little structure. The electro-positive regions are around the Si sites and are polarized in a direction normal to the hexagonal stacking axis. Electric fields have also been mapped in projection upon several planes in the unit cells of SiO2 and Al2O3.