the determination of quartz to warrant discussion. It may be mentioned, however, that the rapid, highly specific spectrographic examination may aid the analyst by giving an indication of what interfering crystalline materials may be present.

The three most widely used methods for the determination of quartz depend on preferential solubility in various solvents. The Knopf [5] method treats the sample with hydrochloric acid, hydrofluosilicic acid and finally with hydrofluoric acid. The method is tedious, time consuming, and because of the large number of manipulations required, very prone to technical error. The method of Line and Aradine [6] substitutes fluoboric acid for the hydrofluosilicic acid in the Knopf method but does not overcome the difficulties mentioned. Both methods apply an empirical correction factor for the solution of quartz during the analysis. This correction factor does not take into account the variation in rate of solution due to particle size differences as shown by Moke [7] and Harris.[8] The phosphoric acid method proposed by Durkan [9] reduces some of the disadvantages of the Knopf and the Line and Aradine methods but does not completely eliminate any of them. Other difficulties are introduced, such as the insolubility of various silicates, the necessity for the prediction of quartz loss in hydrofluoric acid treatment and the necessity of determining particle size so that the proper correction factor may be applied.

X-ray diffraction methods for quartz determination have been described by many authors. Sproull [10] described the Hull-Debye-Scherrer method and the Laué procedure, both widely used photographic x-ray technics for qualitative crystal analysis. Gross and Martin [11] and Hicks, McElroy and Warga [12] have adapted these methods to quantitative measurements. While these methods, with their very high degree of specificity, eliminate many of the difficulties of the petrographic and chemical procedures, they introduce other difficulties peculiar to themselves. Many variables in film exposure and processing must be reduced to experimental constants and be held under close control. Owing to the poor resolution of many x-ray cameras, the problem of background interference and line superposition are difficult to evaluate. The photographic technic does offer two distinct advantages over the methods described below. These are, first, the fact that the exposure time of the film is sufficiently long to level out any fluctuations in x-ray

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