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Effects of quench methods on Fe^{3+}/Fe^{2+} ratios: Reply

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We appreciate Fudali's (1988) careful reading of our paper (Dyar et al., 1987) that describes a comparative study of Fe^{3+} and Fe^{2+} measurements of experimentally produced silicate glasses using Mössbauer and wet-chemical techniques. Calculations we previously performed to test the sensitivity of f_{O_2} values (determined by the method of Kilinc et al., 1983) to errors inherent in the analysis of Fe^{3+} and Fe^{2+} have been reviewed. We used the chemical analysis reported by Tatlock et al. (1976) for U.S. Geological Survey rhyolite rock standard RGM-1, and a temperature of 1000 °C for test calculations. Values of Fe_2O_3 and FeO were incrementally changed, and f_{O_2} was calculated for each set of values. These tests confirm the observation made by Fudali that the statement in our paper ascribing a 1 log unit f_{O_2} change to a 10% error in the ratio Fe^{3+}/Fe^{2+} is incorrect. We regret the fact that this error could not be corrected before publication.

Fudali's final comment about the potential problems posed for petrochemical interpretations by the inherent difficulties of accurately measuring Fe^{3+} and Fe^{2+} in silicate glasses is gratifying. The observations of Fudali and coworkers (1987) amplify our concerns (Dyar et al., 1987) about accurately measuring Fe^{3+} in reduced glass compositions containing low concentrations of Fe^{3+}.

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