Supporting evidence for the spread of RI values for the database

For the 244 samples, RI ranges from 1.5175 to 1.5424. Figure 1 shows the samples ranked in ascending RI value. The error bars are set at ± 0.0005. The samples with overlapping error bars are indistinguishable from each other. The graph shows that most of the samples are unable to be distinguished by RI alone; there are small groups of samples at both ends that can be discriminated from the bulk of the samples, but not from each other.

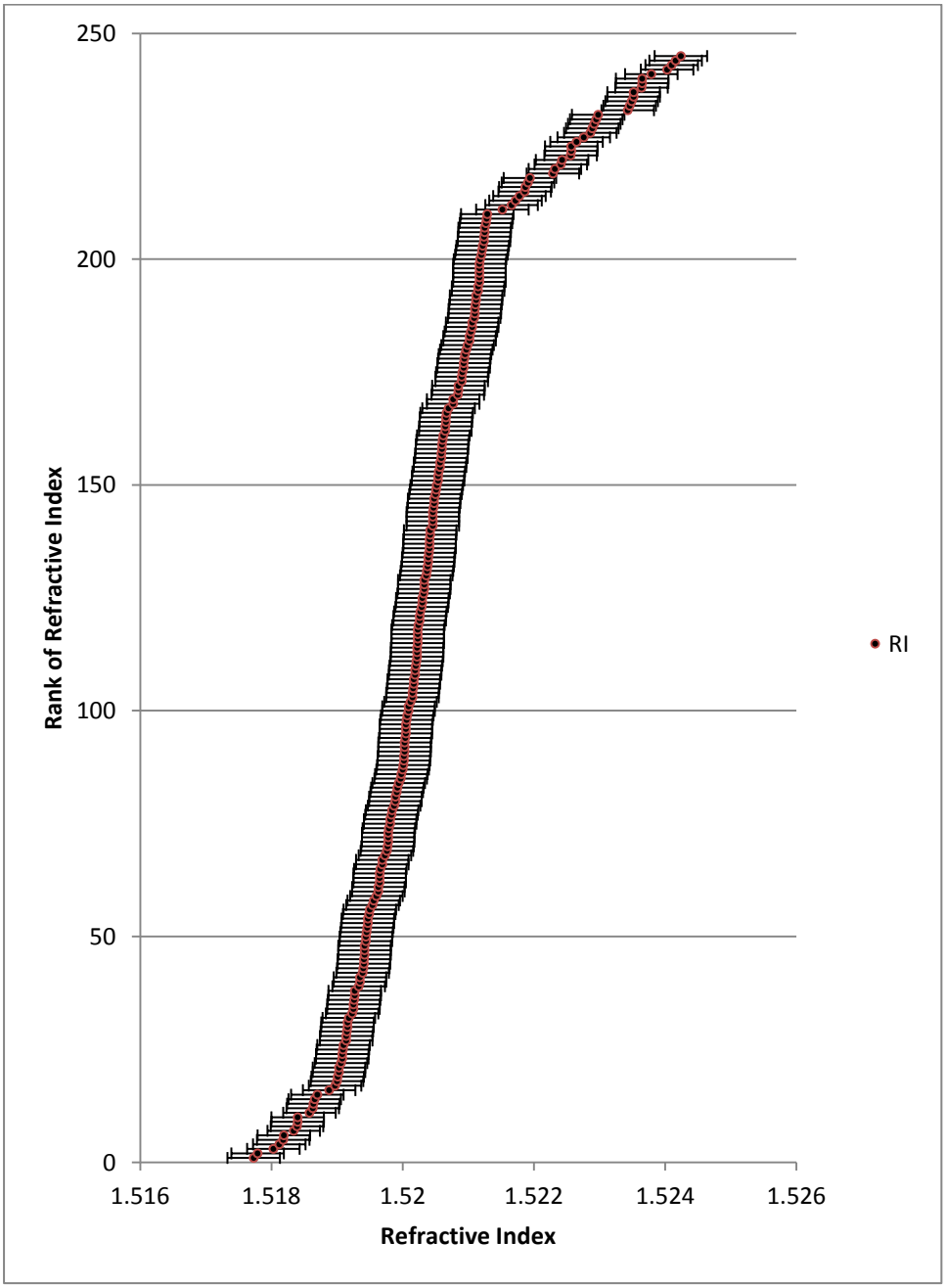

Figure 1 Rank of the 244 database samples by increasing RI value. Error bars are set at ± 0.0005. Samples with overlapping error bars are indistinguishable. No samples can be distinguished from all other samples using RI.

Supporting evidence for the use of FGS 2.

FGS 2 was compared to NIST 612 as the calibration standard. This comparison took place using the database samples. The difference in the measurements[1] with each standard was divided by the average of the two measurements and plotted against the sample in a scatter plot to examine the difference in reported concentrations.

The Holden windscreen was used as a sample to compare the difference in measurement between the two standards. Figure 2 shows the percentage difference in reported values. The elements which exceed 5% are the same elements found when NIST 612 is used as the calibration standard to report the values of FGS 2. NIST 612 reports Mg with a value 19% higher than FGS 2. NIST 612 reports Al, Rb, La, Ce and Nd between 5 and 8% higher. FGS 2 reports Li values 8% higher than NIST 612 does. Data from the Mitsubishi side window also showed the same trend.

All database samples (including replicates) were averaged, and this value was used to examine the measurement difference between the two standards across all samples. Most elements had less than 5% difference between the two standards (Figure 3). Al, Rb and La were about 7% higher when using NIST 612 and Ce was 5% higher. Li had a 10% higher measurement when FGS 2 was used as the calibration standard. However, this set of data does not have a large difference in the Mg values. There is no obvious apparent reason for this.

[1] The values are calculated using NIST 612 measurements minus FGS 2 measurements.

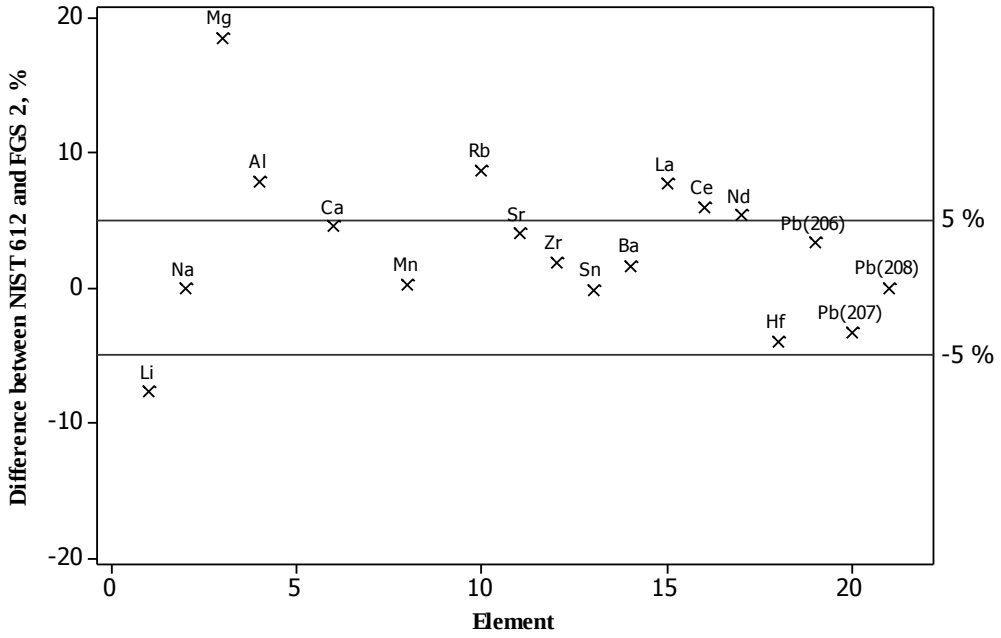

Figure 2 Difference between measurement values for the Holden windscreen using NIST 612 and FGS 2 as the standards.

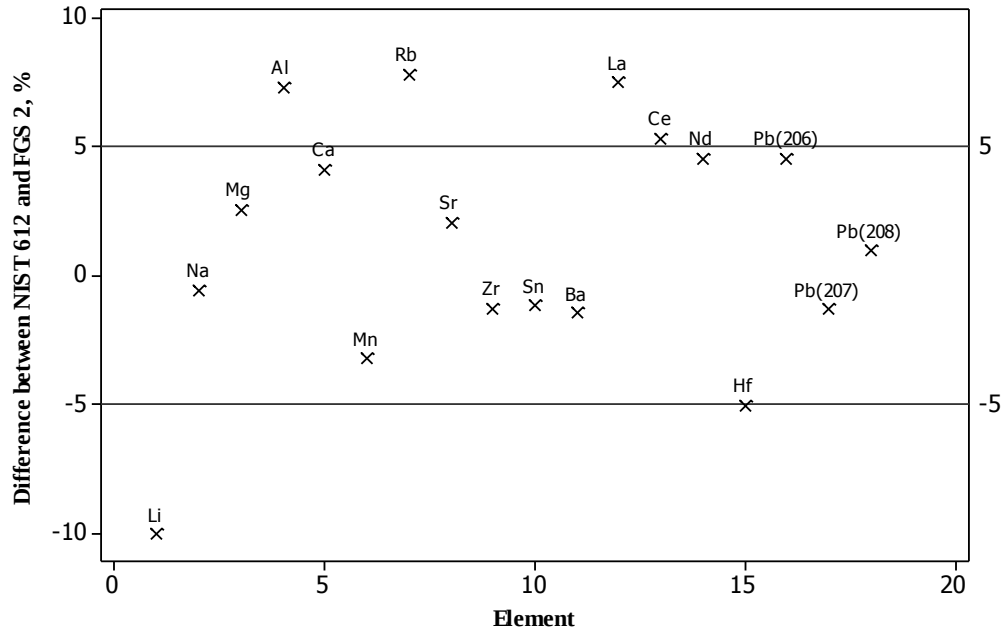

Figure 3 Difference between measurement values for all database samples using NIST 612 and FGS 2 as standards.