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Wolfe, Mikayla (School: Tioga High School)

This experiment determines if data from 1975, on water hardness in the US ties in with todays data. Email FFA advisors in US & ask to send area water samples. Organize vials by water hardness level. Using distilled water, make 1:10 dilution with the sample water (5mL sample, 45 mL distilled). Shake to ensure dilution is mixed. Add 1 mL of Lanthanum Oxide. Turn on acetylene gas, allowing the flame to run in the Fast Sequential Atomic Absorption Spectrometer (FSAAS). Use distilled water to get a control for results. Then use two standards (1mg/L and 5mg/L) to establish a calibration curve of Ca & Mg. Put sample #1 in holding box. Place tubing into beaker. Water will be drawn up into flame, & will atomize the solution, which allows for analysis. A Ca Mg lamp will shoot a current of light through the flame, and Ca & Mg particles will be picked up. The FSAAS will read how much Ca & Mg is in the flame. Repeat steps 8-11 with samples 2-8. Once samples analyzed, use the formula: Total Hardness = (2.497 x Ca mg/L) + (4.116 x Mg mg/L) Record total hardness. The hypothesis stated that each sample would be slightly harder than given by 1975 data. After viewing results, I noticed an error relating to stated hypothesis. Out of all eight samples, only one ties in with stated hypothesis. This one sample was in the soft category. Out of all 8 samples, there also was only one that was within normal limits of its category. 6 of 8 samples were erratic from normal limits. Sample 1 was very hard, even though it was in the soft category according to 1975. Samples 2 and 3 were the ones that were normal/slightly harder. Samples 4-8 were exceedingly softer than in 1975. In conclusion, the hypothesis is mostly wrong, due to the fact that only 1 sample was slightly harder than given by 1975 data.

Awards Won: