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**delta zeta: Improvement of the reproducibility of zeta potential measurements by transformation** DANISH FARUQUI, PAUL J. SIDES, ANDREW J. GELLMAN[1], Carnegie Mellon Univ — When measuring the zeta potential of planar substrates as a function of pH, the results sometimes varied day by day even for the same sample treated exactly the same way. The shapes of the titration curves, however, were consistent despite apparent offsets. When data acquired on fused silica were transformed by subtracting the zeta potential measured at the initial condition from each subsequent measurement, however, data from many experiments fell on the same curve with a much reduced variance. Examination of the fundamental relationship between charge density and the zeta potential, derived from the Gouy Chapman theory of the electrical double layer, revealed that subtraction of the initial datum from each subsequent point amounted to cancellation of the total number of ionizable sites from the measurement. The transformed data reflected only chemical information such as equilibrium constants and activities. The principle assumptions are that the number of ionizable sites are fixed during a given experiment and the zeta potential magnitude is 100 mV or higher. Model expressions were verified for different mineral surfaces in range of aqueous solutions.

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