

Currie, L.A., Benner, B. A., Kessler, J.D., Klinedinst, D. B., Klouda, G.A., Marolf, J.V., Slater, J. F., Wise, S. A., Cachier, H., Cary, R., Chow, J.C., Watson, J., Druffel, E. R. M., Masiello, C. A., Eglinton, T.I., Pearson, A., Reddy, C.M., Gustafsson, O., Hartmann, P. C., Quinn, J. G., Hedges, J.I., Prentice, K. M., Kirchstetter, T.W., Novakow, T., Puxbaum, H. and Schmid, H., *A critical evaluation of interlaboratory data on total, elemental, and isotopic carbon in the carbonaceous particle reference material, NIST SRM 1649a*, Journal of Research of the National Institute of Standards and Technology, 2002; v107, 279-298

A primary purpose of this report is to provide documentation for the new isotopic and chemical particulate carbon data for certified, reference and information values in Tables 12 and 13 of the Certificate of Analysis. Supporting this is a critical review of underlying international intercomparison data and methodologies, provided by 18 teams of analytical experts from 11 institutions. Key results of the intercomparison are: (1) a new, Certified Value for total carbon (TC) in SRM 1649a; (2) ^{14}C Reference Values for total carbon and a number of organic species, including 8 individual PAH; and (3) elemental carbon Information Values for 13 analytical methods applied to elemental carbon (EC). Elemental carbon comprised a special focus of the intercomparison. The results are diverse, reflecting the confounding of methodological-matrix effect artifacts, and information on different regions of the "black carbon spectrum" representing more or less refractory forms of this universal product of combustion. These data can be described in terms of three clusters, centered at EC/TC ratios of 0.075, 0.28, and 0.46. Availability of both chemical and ^{14}C speciation data for SRM 1649a holds great promise for improved analytical insight through comparative analysis (e.g., fossil/biomass partition in EC compared to PAH), and through the application of the principle of isotopic mass balance.