

# Appendix D Reporting Protocol for Nonstandard Measurements

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When measurements are made that do not follow standard, published WOCE protocols, then an essential part of the submission of data is a description of the precise protocol that you used. The following standard form is used for describing protocols, and all information should be provided for each measurement made on the cruise. In particular, if the accuracy and precision are not stated, then for the WOCE purposes of synthesizing global flux estimates the measurements have literally no value. Molar and mass units are standard, for example,  $\mu\text{mol/kg}$ , for all WOCE measurements. Data in raw engineering units, for example, DC volts, are unacceptable.

## **Standard protocol format:**

(proposed by Andrew Dickson, based on an ISO recommendation)

1. **SCOPE AND FIELD OF APPLICATION:**  
(e.g. This procedure describes a method for the determination of ... The method is suitable for oceanic concentrations between ...)
2. **DEFINITION:**  
(e.g. The ..... content is defined as ....)
3. **PRINCIPLE:**
4. **APPARATUS:**  
(specific equipment and supplies)
5. **REAGENTS:**  
(purity and concentrations of stock solutions)
6. **SAMPLING:**  
(preparation (e.g. cleaning) of sample containers; how samples should be taken, preserved and stored, cautions)
7. **PROCEDURES:**  
(detailed description of sample treatment - e.g. size fractionation, incubation or (sub)sample size -, analysis - “recipe” - with consideration of blank determination, standards and calibrations, availability, sources and costs of standard reference material,...)
8. **CALCULATION AND EXPRESSION OF RESULTS:**  
(Clear and unambiguous description of data analysis including an example of a complete computation)
9. **QUALITY CONTROL / QUALITY ASSESSMENT:**  
(procedures to control specified goals for reproducibility and possible bias - required precision and accuracy)
10. **NOTES:**  
(general precautions, possible modifications, backward compatibility)

**11. INTERCOMPARISON:**

(requirements for “intercalibration” between different labs or methods, results of prior efforts and recommendations for the future)