{rokbox title=|Theoretical differences in pHT (y axis) between values using the CB'93 parametrization with the DVD'98 correction :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-two-decades-pht-ibañez-2026-thumb-et-al.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-two-decades-pht-ibañez-2026-et-al.jpg{/rokbox}

Fiz F. Pérez, Marta López-Mozos, Marcos Fontela, **Maribel I. García-Ibáñez**, Noelia Fajar, Xosé Antonio Padín, Mónica Castaño-Carrera, Mercedes de la Paz, Lidia I. Carracedo, Marta Álvarez, Herlé Mercier, Pascale Lherminier and Antón Velo, 2026.
Two decades of pHT measurements along the GO-SHIP A25 section in the North Atlantic
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Abstract:The North Atlantic (NA) GO-SHIP (Global Ship-based Hydrographic Investigation Program) A25 OVIDE-BOCATS (Observatoire de la variabilité interannuele à décennale en Atlantique Nord – Biennial Observation of Carbon, Acidification, Transport and Sedimentation in the North Atlantic) section is a long-term repeat hydrographic transect extending from Portugal to Greenland. Since 2002, physical and biogeochemical measurements have been carried out biennially along the OVIDE-BOCATS section, contributing to a better understanding of water mass properties, mixing, circulation, carbon storage, and climate change impacts such as ocean acidification (OA) in the NA. In particular, the high-precision pH measurements on the total hydrogen ion scale (pHT) from the OVIDE-BOCATS program represent a key milestone in monitoring OA in this particularly climate sensitive region. The method used for pHT determination relies on adding meta-cresol purple (mCP) dye to the seawater sample and spectrophotometrically measuring its absorbances at specific wavelengths. The OVIDE-BOCATS program has used unpurified mCP dye, which impurities have been proven to bias pHT values. Here we quantified the bias induced by these impurities in pHT measurements. We found that measurements carried out using the unpurified mCP dye tend to be, on average, 0.011±0.002 pHT units higher than those obtained using the purified mCP dye, with this difference slightly decreasing at higher pHT values. Moreover, we tested independent methods to correct the effect of impurities in both the historical and recent OVIDE-BOCATS pHT data, demonstrating that the correction is consistent across methods. The long-term pHT dataset has been updated to include newly acquired data and absorbance measurements, and to standardize corrections for mCP dye impurities. This effort results in a twenty-year dataset of pHT corrected for mCP dye impurities, that demonstrates the possibility of a global effort to improve the reliability and coherency of spectrophotometric pHT measurements made with unpurified mCP dye. The corrections applied to our pHT dataset have negligible implications for the OA rates previously reported, but they do affect the depth of the aragonite saturation horizon, implying a shoaling of approximately 150 m.

Keywords: Ocean acidification, pHT measurements, GO-SHIP A25, North Atlantic