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thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-spectrophotometric-measurement-carbonate-ion-seawater-guallart-et-al-2022-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-spectrophotometric-measurement-carbonate-ion-seawater-guallart-et-al-2022.jpeg{/rokbox}

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, Abed El Rahman Hassoun, Fiz F. Pérez, Regina A. Easley, and Marta Álvarez, 2022.

[Spectrophotometric Measurement of Carbonate Ion in Seawater over a Decade: Dealing with Inconsistencies.](#)

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Abstract: The spectrophotometric methodology for carbonate ion determination in seawater was first published in 2008 and has been continuously evolving in terms of reagents and formulations. Although being fast, relatively simple, affordable, and potentially easy to implement in different platforms and facilities for discrete and autonomous observations, its use is not widespread in the ocean acidification community. This study uses a merged overdetermined CO₂ system data set (carbonate ion, pH, and alkalinity) obtained from 2009 to 2020 to assess the differences among the five current approaches of the methodology through an internal consistency analysis and discussing the sources of uncertainty. Overall, the results show that none of the approaches meet the climate goal (± 1 % standard uncertainty) for ocean acidification studies for the whole carbonate ion content range in this study but usually fulfill the weather goal (± 10 % standard uncertainty). The inconsistencies observed among approaches compromise the consistency of data sets among regions and through time, highlighting the need for a validated standard operating procedure for spectrophotometric carbonate ion measurements as already available for the other measurable CO₂ variables.

Keywords: ocean acidification, saturation states, bio-geochemistry, oceanic carbon cycle, time-series, CO₂ system monitoring, CO₂ system variables, climate goal