

Ocean acidification is the ongoing decrease in the pH of the Earth's oceans, caused by the uptake of carbon dioxide (CO₂) from the atmosphere. The main cause of ocean acidification is the burning of fossil fuels. Seawater is slightly basic (meaning pH > 7), and ocean acidification involves a shift towards pH-neutral conditions rather than a transition to acidic conditions (pH < 7). The issue of ocean acidification is the decreased production of the shells of shellfish and other aquatic life with calcium carbonate shells. The calcium carbonate shells can not reproduce under high saturated acidotic waters. An estimated 30–40% of the carbon dioxide from human activity released into the atmosphere dissolves into oceans, rivers and lakes. Some of it reacts with the water to form carbonic acid. Some of the resulting carbonic acid molecules dissociate into a bicarbonate ion and a hydrogen ion, thus increasing ocean acidity (H⁺ ion concentration). Between 1751 and 1996, surface ocean pH is estimated to have decreased from approximately 8.25 to 8.14, representing an increase of almost 30% in H⁺ ion concentration in the world's oceans. Earth System Models project that, by around 2008, ocean acidity exceeded historical analogues and, in combination with other ocean biogeochemical changes, could undermine the functioning of marine ecosystems and disrupt the provision of many goods and services associated with the ocean beginning as early as 2100.¹

In the present book, fifteen typical literatures about ocean acidification published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on ocean acidification. We hope this book can demonstrate advances in ocean acidification as well as give references to the researchers, students and other related people.

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¹ https://en.wikipedia.org/wiki/Ocean_acidification