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Physical and chemical properties of residual water bodies of the former Aral Sea.

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The Aral Sea has been steadily shrinking since the 1960s after the Syr Darya and Amu Darya rivers were diverted by Soviet irrigation projects.
In 1989 the level of the Aral Sea dropped by 40 m and the lake was split into two separate bodies of water, namely, the Small Aral Sea in the north and the Large Aral Sea in the south. In 2003 the Large Aral Sea also divided into two water basins, eastern and western, connected by a narrow (50-500 m) and long (40 km) channel. In 2004 a small Tushybas Gulf separated from the western basin of the South Aral Sea and also formed an isolated lake. As a result, during the last 30 years the former Aral Sea transformed into several separate water bodies with significantly different physical and chemical properties.
In this work we studied concentrations of the major ions and their spatial and temporal variability in the separate water basins of the former Aral Sea.
The analyzed water samples were collected during the field surveys of the Shirshov Institute of Oceanology in the central part of the western basin of the Large Aral Sea, the Chernyshev Bay (the semi-isolated part of the Large Aral Sea), the Tushybas Lake, and the Small Aral Sea in 2014-2017.
We determined ionic composition of these water samples using potentiometric titrator Titrando 905 (Metrohm) and chromatograph 930 Compact IC Flex (Metrohm). The obtained ratios of major ions for all considered water basins of the former Aral Sea are significantly different among them as well as from standard sea water. Also we studied dependence of equations of state of these water samples on their ionic composition using density meter DMA 5000M (Anton Paar).