The Hofmeister series is a classification of ions regarding their ability to stabilize or destabilize aqueous solutions of proteins, polymers and other molecules which are partly miscible with water. In this study, we employ differential scanning calorimetry to investigate how the stability of aqueous solutions of poly(propylene oxide) is affected by mixtures of ions with different location in the Hofmeister series. Our results show that the Hofmeister effects of pure salt species are not always linearly additive and that the relative effect of some ions can be reversed depending on the composition of the salt mixture as well as by the absolute and relative concentration of the different species. We suggest that these results can lead to a better understanding of the potential role of the Hofmeister effect in regulation of biological processes, which does always take place in salt mixtures rather than solutions containing just single salt species.