Quantitative Sensing of Mineral Water with Multichannel Taste Sensor

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The taste of commercial mineral water was investigated using a multichannel taste sensor with lipid membranes. The electric potential pattern constructed of eight outputs from the membranes contains information on the taste quality and intensity. Individual brands of mineral water were clearly distinguished by the patterns of output signals. A two-dimensional taste map was obtained by a principal component analysis of the patterns. The first principal component axis roughly corresponds to the hardness of mineral water, i.e., the concentration of Ca^{2+}. On the other hand, the second principal component axis depends on the concentrations of both Ca^{2+} and HCO_3^-. The taste of hard water is located between bitter and salty taste qualities.

1.   Introduction

Taste can be measured with a multichannel lipid-membrane sensor which responds to different taste qualities by showing unique patterns of sensor output signals.[1-8] The sensor utilizes lipid membranes as transducers of taste substances and a computer as a data analyzer. The transducer transforms taste information generated by chemical substances into electric potential changes. The multichannel taste sensor using lipid membranes does not measure the amount of each taste substance, but the taste quality and also the intensity

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