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Development of Semiconductor Gas Sensor for 2-Methylpyrazine from Consomme Soup

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A semiconductor gas sensor based on WO_3 was exploited for detecting 2-methylpyrazine (MP), a typical flavor component of consomme soup. Of the elements examined, the Rh-WO_3 element showed excellent sensing properties for MP at 300°C, particularly in sensitivity and selectivity. Moreover, the element was found to be capable of differentiating the quality of soup samples in agreement with a human sensory test.

1. Introduction

Detection of various odors has become increasingly important in recent years. For the purposes of monitoring odors in environmental or living atmospheres and in human breath, various smell components such as volatile sulfides,[1-4] amines,[5,6] and aromatics[7] have been the targets of semiconductor gas sensors. A newly emerging market for odor sensors appears to be in food industries where odor sensing may be applied effectively for controlling the quality of foods in storage or in the manufacturing process. For example, Ru-TiO_2[8] and MgO-In_2O_3[9] sensors have been reported to recognize the freshness of fish or squid from the concentration of trimethylamine evaporated. On the other hand, few sensors have been applied to