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(54) Title: AMPEROMETRIC ELECTROCHEMICAL CELLS AND SENSORS

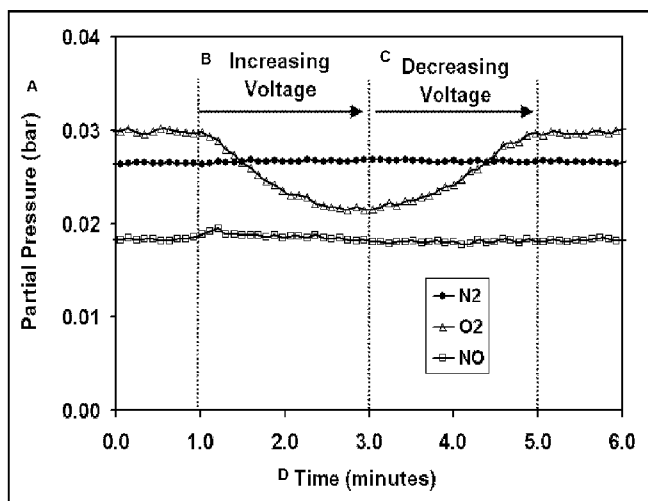


Figure 3

A ... Pression partielle (bar)
B ... Augmentation tension
C ... Réduction tension
D ... Temps (minutes)(57) Abstract: Amperometric ceramic electrochemical cells comprise, in one embodiment, an electrolyte layer, a sensing electrode layer, and a counter electrode layer, wherein the cell is operable in an oxidizing atmosphere and under an applied bias to exhibit enhanced reduction of oxygen molecules at the sensing electrode in the presence of one or more target gases such as nitrogen oxides (NO_x) or NH₃ and a resulting increase in oxygen ion flux through the cell. In another embodiment, amperometric ceramic electrochemical cells comprise an electrolyte layer comprising a continuous network of a first material which is ionically conducting at an operating temperature of about 200 to 550°C; a counter electrode layer comprising a continuous network of a second material which is electrically conductive at an operating temperature of about 200 to 550°C; and a sensing electrode layer comprising a continuous network of a third material which is electrically conductive at an operating temperature of about 200 to 500°C, which sensing electrode is operable to exhibit increased charge transfer in the presence of one or more target gas species. These electrochemical cells and additional electrochemical cell embodiments are suitable for use in gas sensors and methods of sensing or detecting one or more target gases.

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