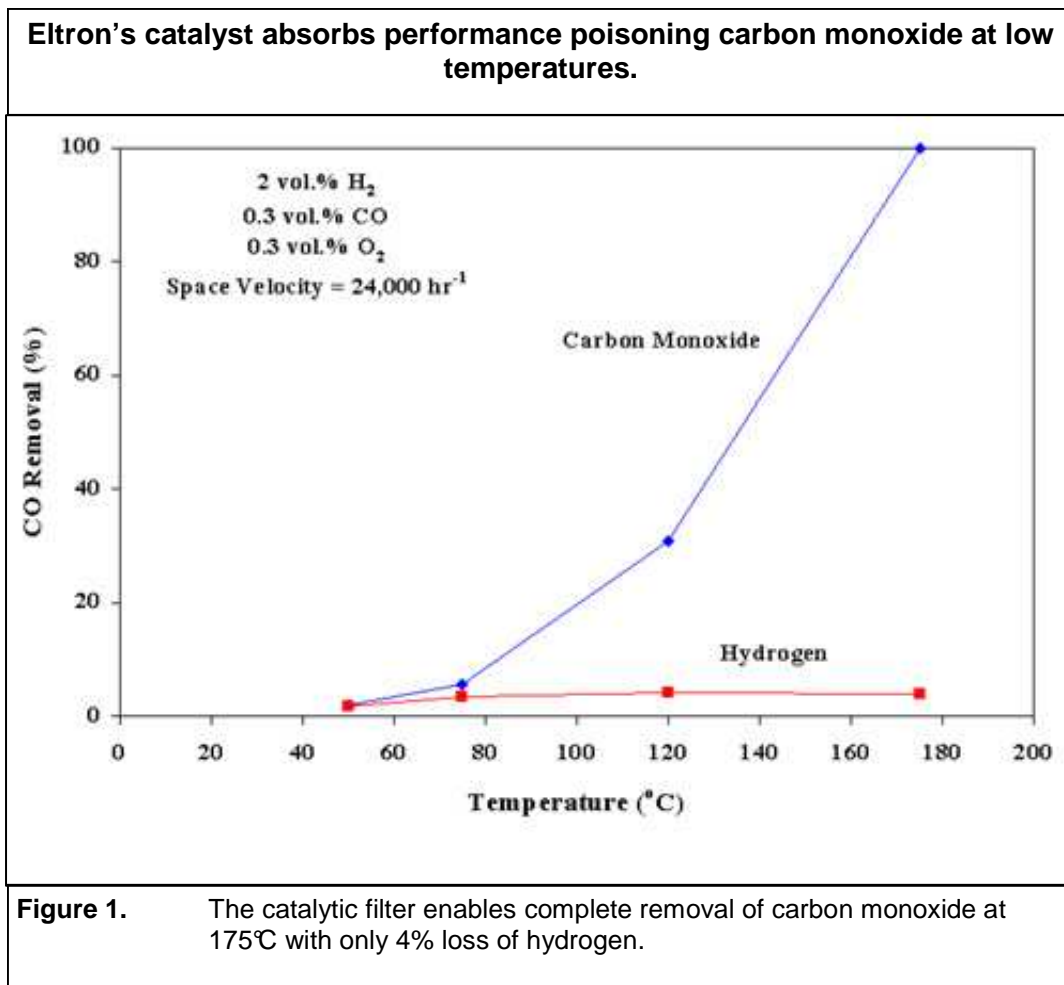




Selective Removal of Carbon Monoxide

Eltron Research & Development has developed a catalyst that effectively oxidizes CO into CO₂ without affecting the other constituents in the gas stream. An example application is the removal of trace quantities of CO upstream of PEM fuel cells, where CO is a severe poison. *The catalyst has been shown in side-by-side experiments to remove CO in the presence of hydrogen at lower temperatures than commercially available materials.*

Hydrogen-fueled polymer electrolyte membrane fuel cells (PEMFCs) are desirable for power generation due to their high efficiency and power density, low emissions, low operating temperature, small size, and portability. Because of these characteristics, hydrogen PEMFCs are being developed for

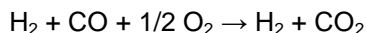


The Problem

Storage and transportation of pure hydrogen is difficult; therefore, alternative fuels, such as natural gas or methanol potentially are more practical for commercial devices. When using these fuel sources, a reforming step first is applied to convert the fuel to hydrogen prior to entering the cell. Unfortunately, carbon monoxide produced along with hydrogen in the reforming step severely degrades PEMFC performance by poisoning the Pt based anode electrocatalyst.

The Solution

This problem is corrected through the use of a catalytic filter designed at Eltron to selectively remove carbon monoxide without significantly affecting the hydrogen content of the fuel. The catalytic reaction proceeds as:



The catalyst constituents are selected to preferentially adsorb carbon monoxide relative to hydrogen, and achieve very high oxidation activity at low temperatures. As shown in Figure 1, the catalytic filter enables complete removal of carbon monoxide at 175°C with only 4% loss of hydrogen.

Stage of Development

Eltron has catalyst samples available for 3rd party testing. Eltron's catalyst costs \$1-10/lb.

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