Copper-based catalysts are of comparable importance for industrial reactions, e.g., partial oxidation reactions, as silver catalysts. Ag2Cu2O3 is known as the first silver cuprate, synthesized at comfortable conditions. The studies were based on the presumption that this compound possibly combines the catalytic activity of both metals. A broad study was made of the catalytic activity of silver cuprate in model redox reactions, e.g., oxidative coupling of methane, deNOx, and dehydrogenation of ethane with thermoanalytic techniques (TG/TDA), temperature-programmed oxidation and reduction (TPO/TPR), and thermal desorption spectroscopy (TDS) together with photoelectron spectroscopy (XPS). Scanning electron microscopy (SEM), tunneling electron microscopy (TEM), and XRD were also used to characterize the catalyst.