



Microwave-assisted polyol synthesis of Pt based catalysts for ethanol oxidation reaction



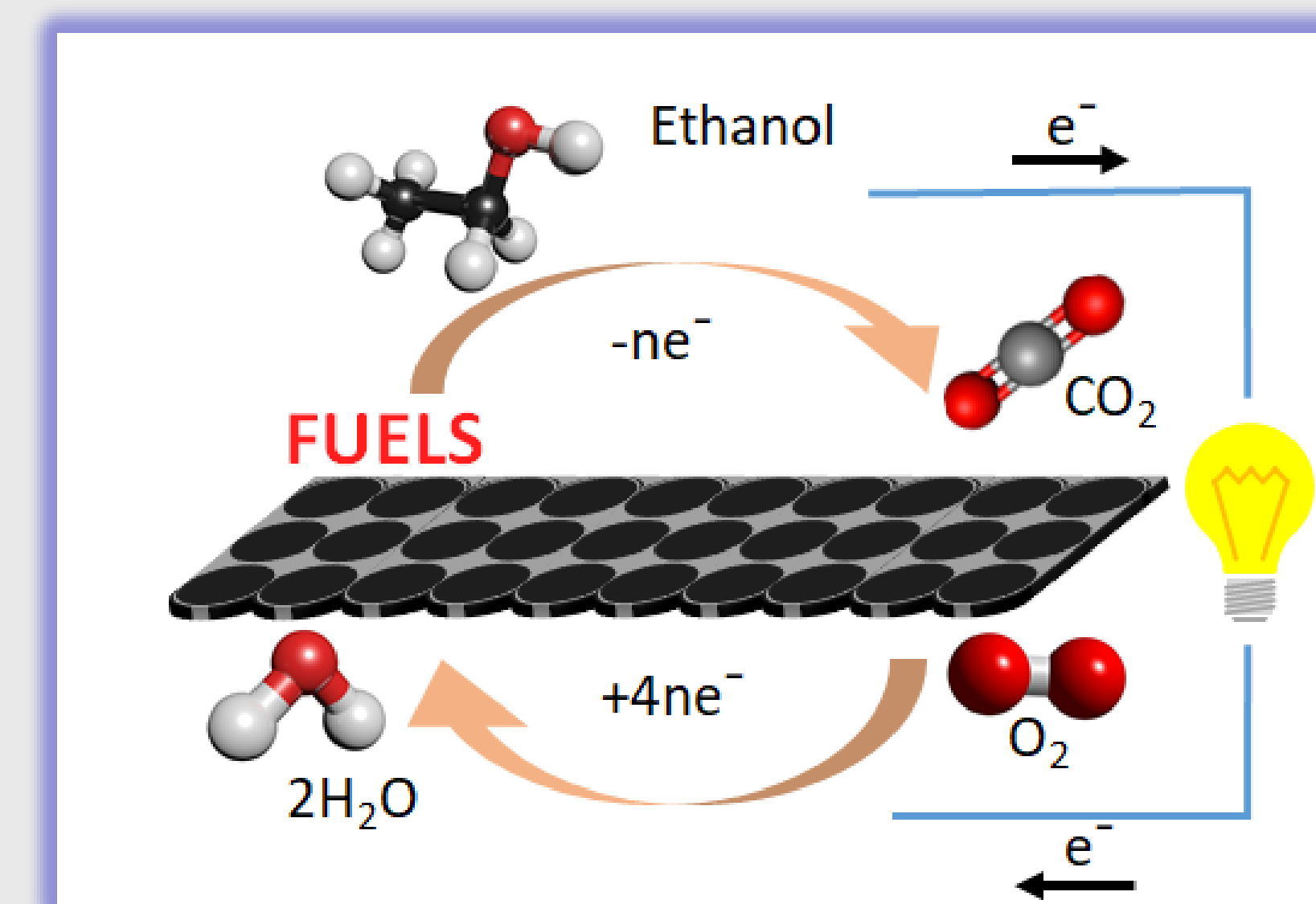
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Why ethanol as a fuel?

Direct ethanol fuel cells (DEFCs) are very promising power sources for stationary and portable electric devices due to its high efficiency and low emissions of pollutants, low operating temperature, high energy density, nontoxic and environmentally friendly characteristics



Catalysts synthesis

0,5 M CuSO₄ or 0,5 ml 0,05 M SnCl₂ +
0,5 ml 0,05 M H₂PtCl₆ + 25 ml C₂H₆O₂ +
1 ml 0,8 M NaOH
20 min stirring



Microwave heating 60 s
for PtSn and PtZn
catalyst; Power 700 W



Stable PtSn, and
PtZn, nanoparticles
synthesized by
microwave assisted
polyol method.



Vulcan XC-R72 in 20
ml H₂O + catalyst
colloid + 150 ml 2M
H₂SO₄
3 h stirring



After filtration the
solid residue was
dried for 3 hours
at 160 °C under a
nitrogen
atmosphere

The aim was to make a catalysts
with 20% weight of metal

Catalysts characterisation

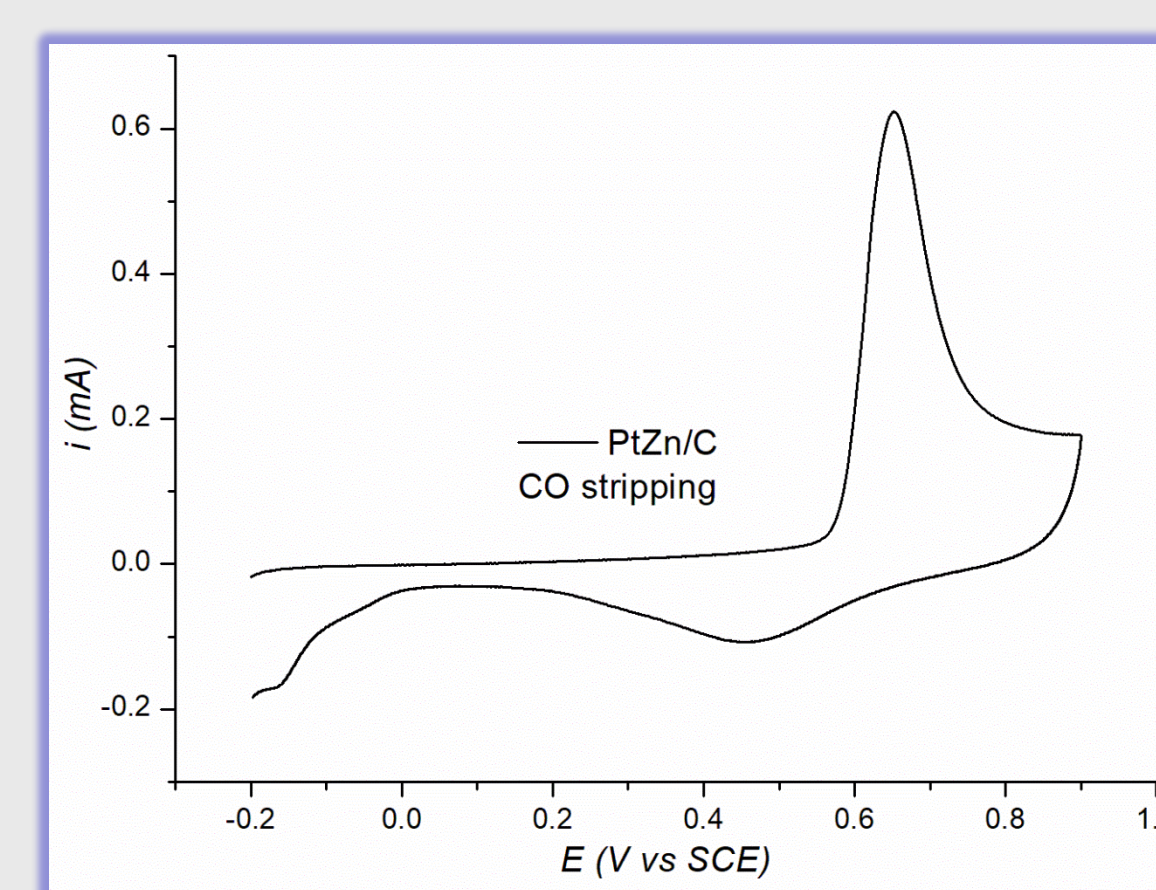
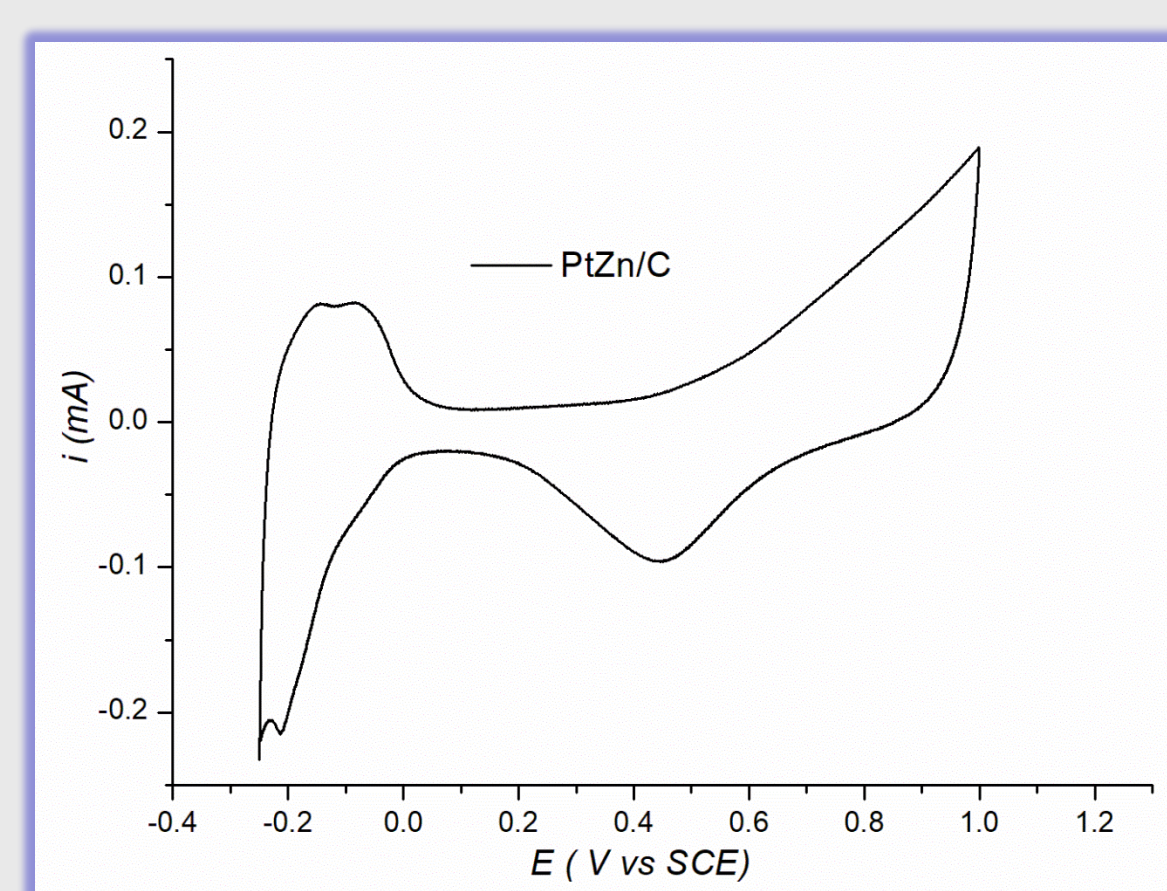


Fig. 1: Cyclic voltammograms and CO stripping curves for PtZn/C catalyst in 0.1 M HClO₄

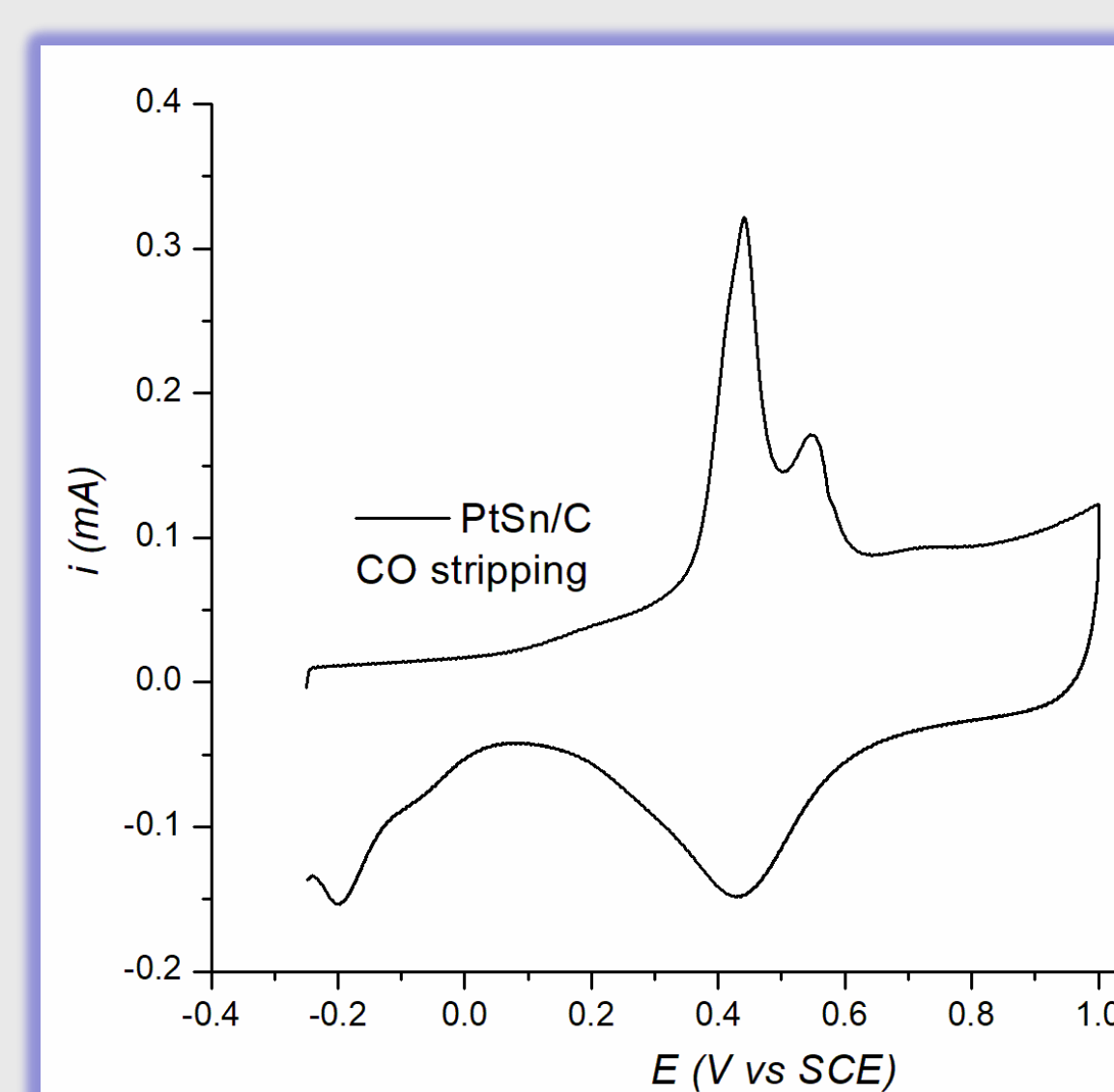
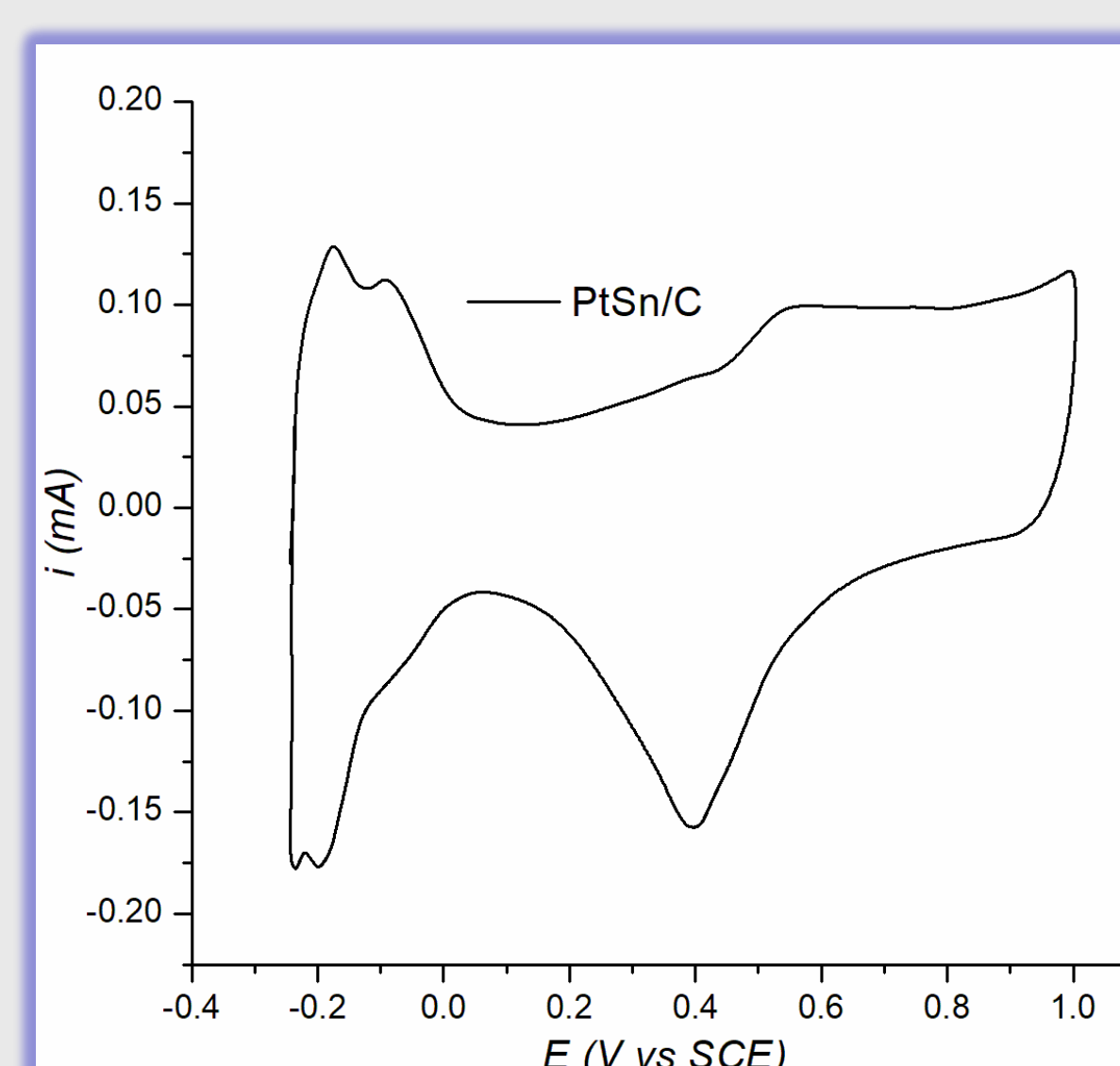


Fig. 2: Cyclic voltammograms and CO stripping curves for PtSn/C catalyst in 0.1 M HClO₄

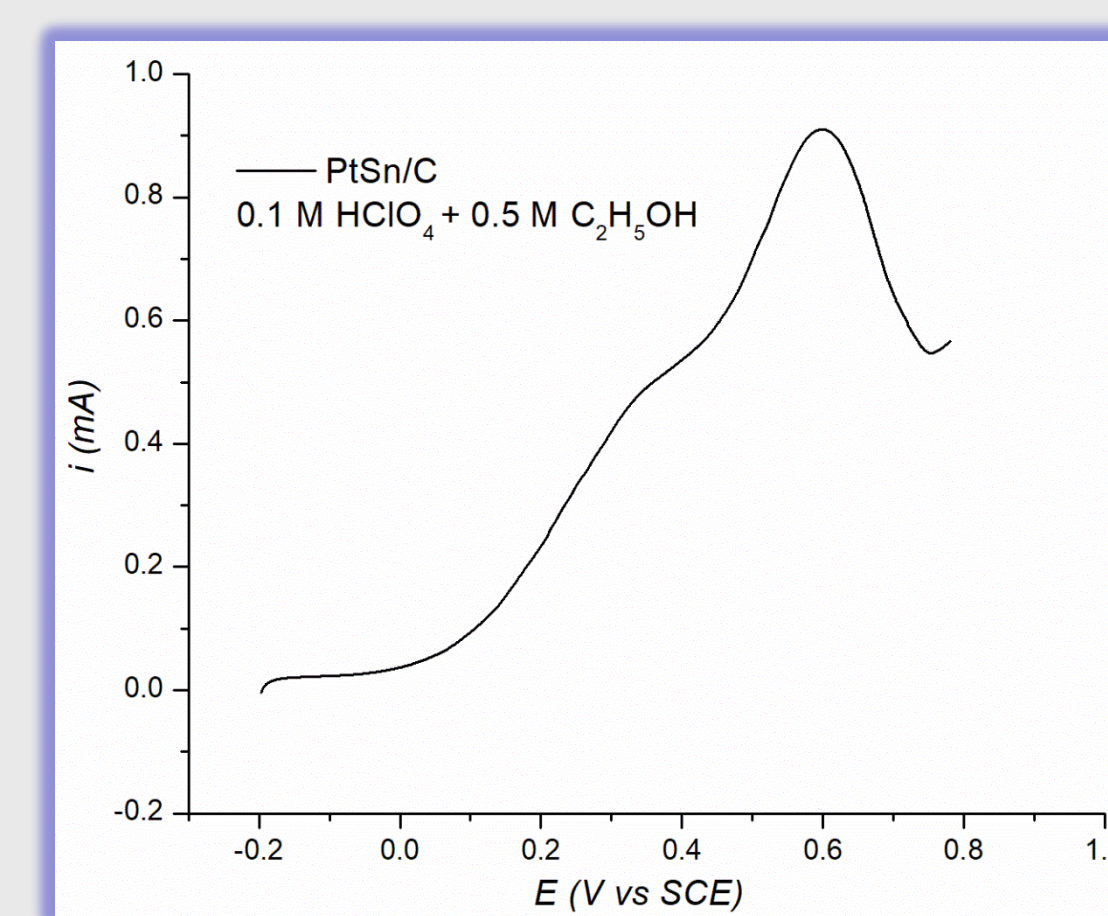
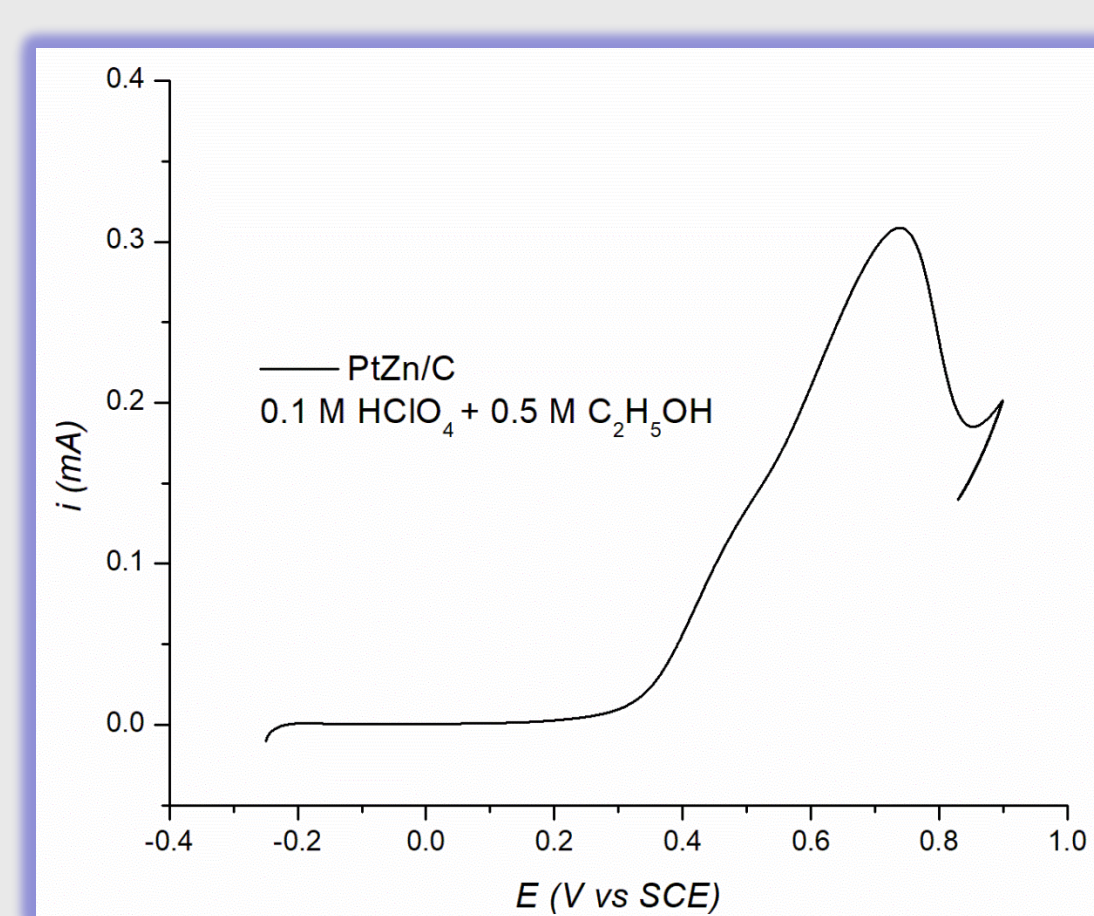


Fig. 3. Ethanol oxidation curves for PtZn/C and PtSn/C catalyst

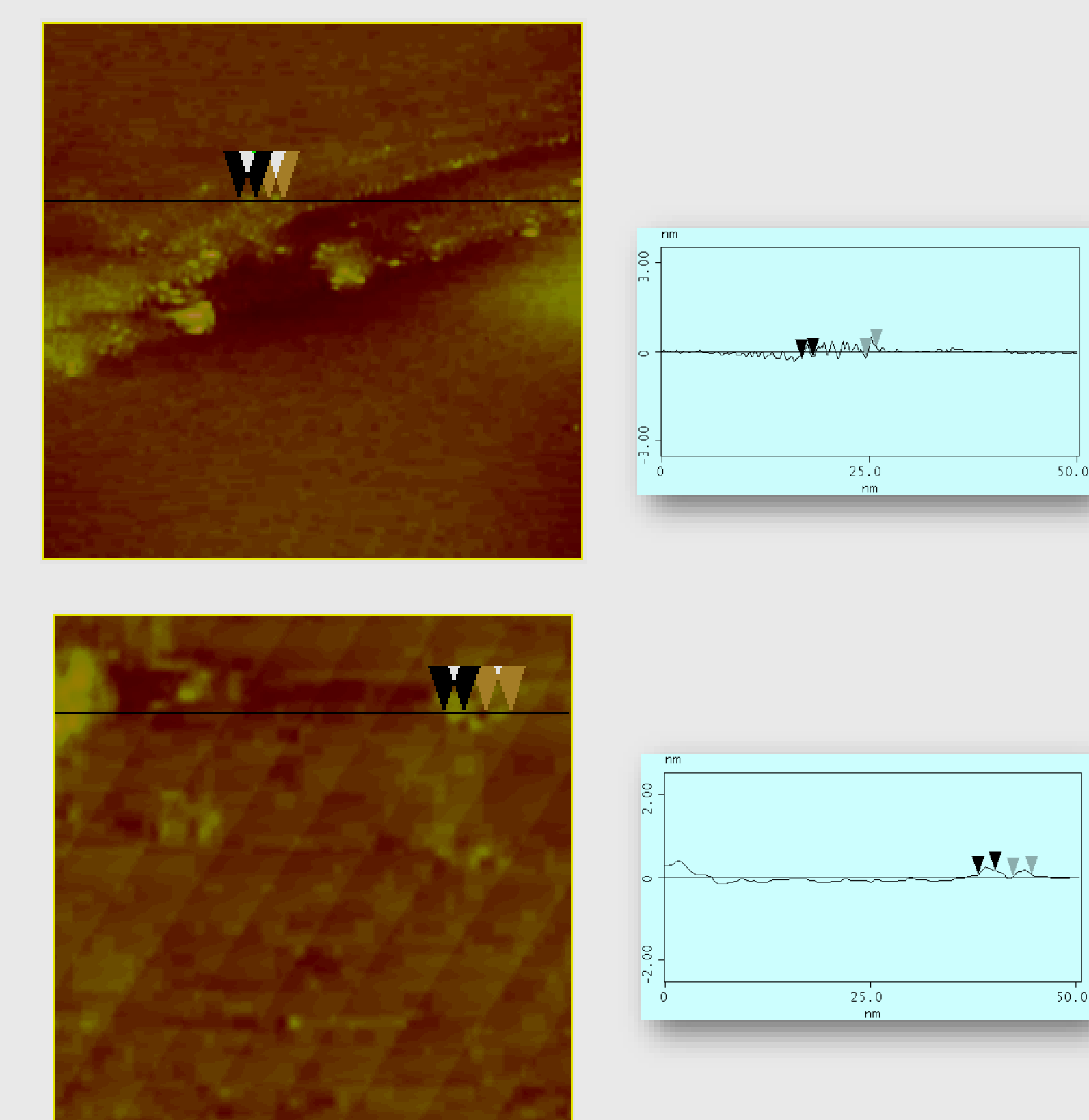


Fig. 4. STM images and line section analysis for PtZn/C and PtSn/C catalyst

