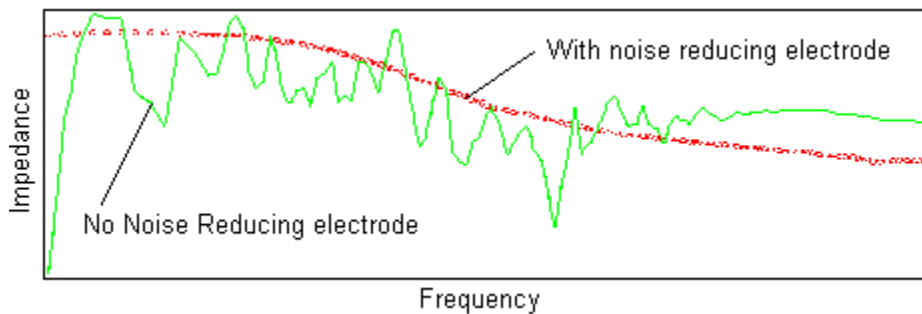
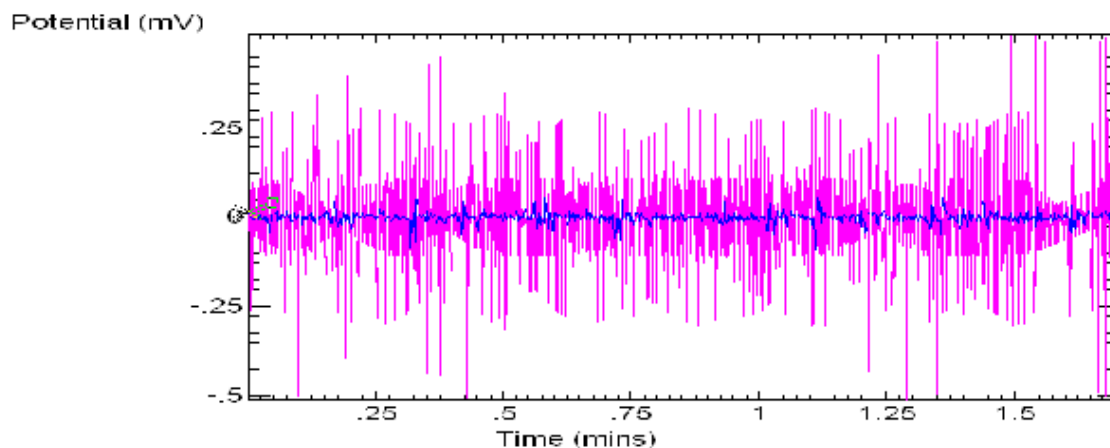


Noise Reducing Electrode

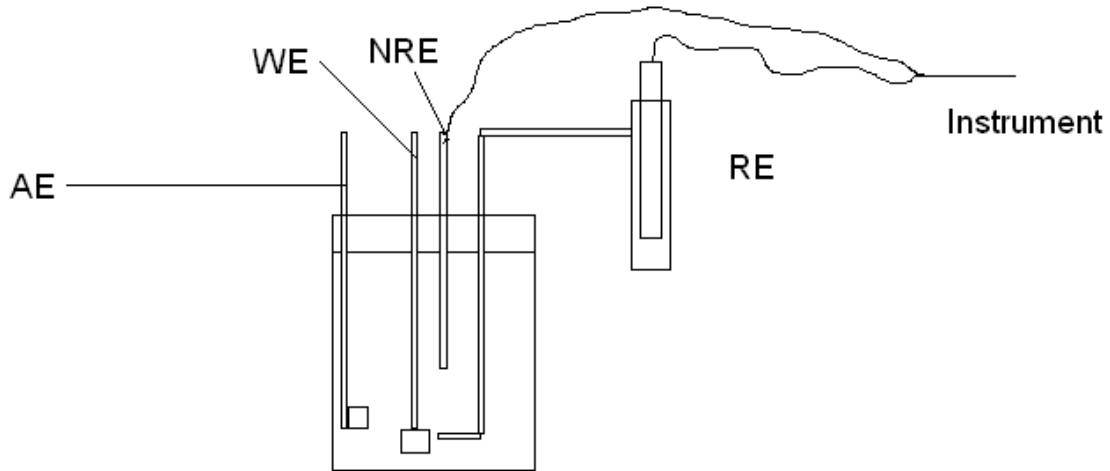
The ACM Noise Reducing Electrode (NR) is designed to overcome the serious problem of induced mains pickup causing unwanted polarisation of the test cell (see the section on induced noise). It also benefits ZRA experiments allowing more gain to be applied to the measurement of potential. Two examples are shown below.



In the example above a working electrode of titanium is immersed in tap water with a lugin probe and SCE. Three electrode AC impedance was performed and the resulting Bode plot shown in green. For the second run using identical parameters a Noise Reducing electrode was added. The Bode plot is shown in red. It is apparent that the red curve is much smoother and because less averaging was needed by the instrument it was faster to obtain.



This plot is taken from a current and voltage noise test on tin in 1M NaCl. Shown in purple is the point to point voltage trace for the system not using a Noise Reducing Electrode and shown in blue is the same experiment using a Noise Reducing electrode. The use of a NR electrode allowed much finer features of the noise trace to be seen.



All ACM Noise Reducing electrodes are made of pure platinum set in a glass tube with the active component sealed in the glass. They are used to capacitively couple the input of the reference electrode buffer to the bulk electrolyte thus providing a low impedance path to ground for voltages induced in the lugin probe/salt bridge. This then ensures that the reference electrode is measured with respect to ground (the potential of WE) and not with respect to ground plus the induced voltage. Some systems in the past such as those involving mains heaters have had so much mains induced polarisation that the results were not correct. The use of a NR electrode stops this unwanted polarisation.