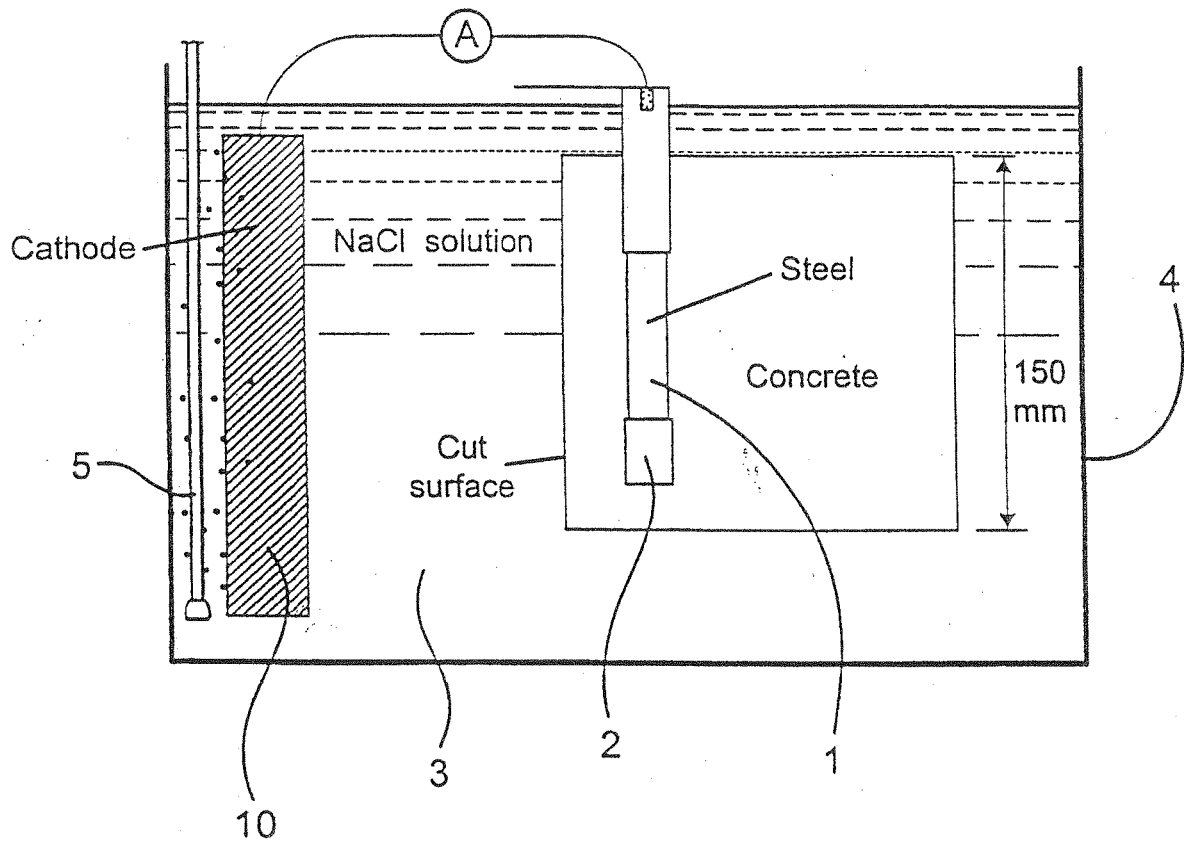
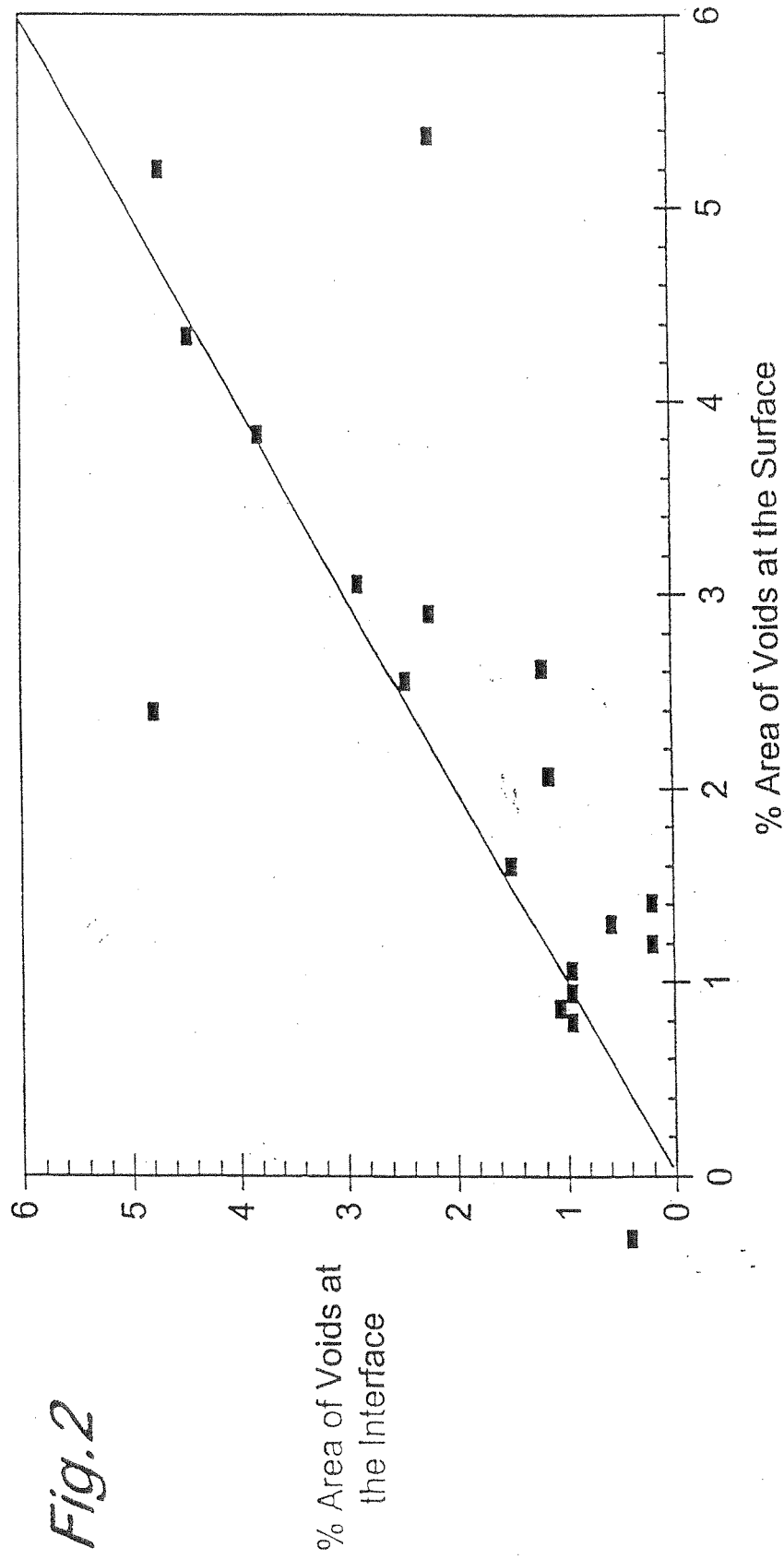
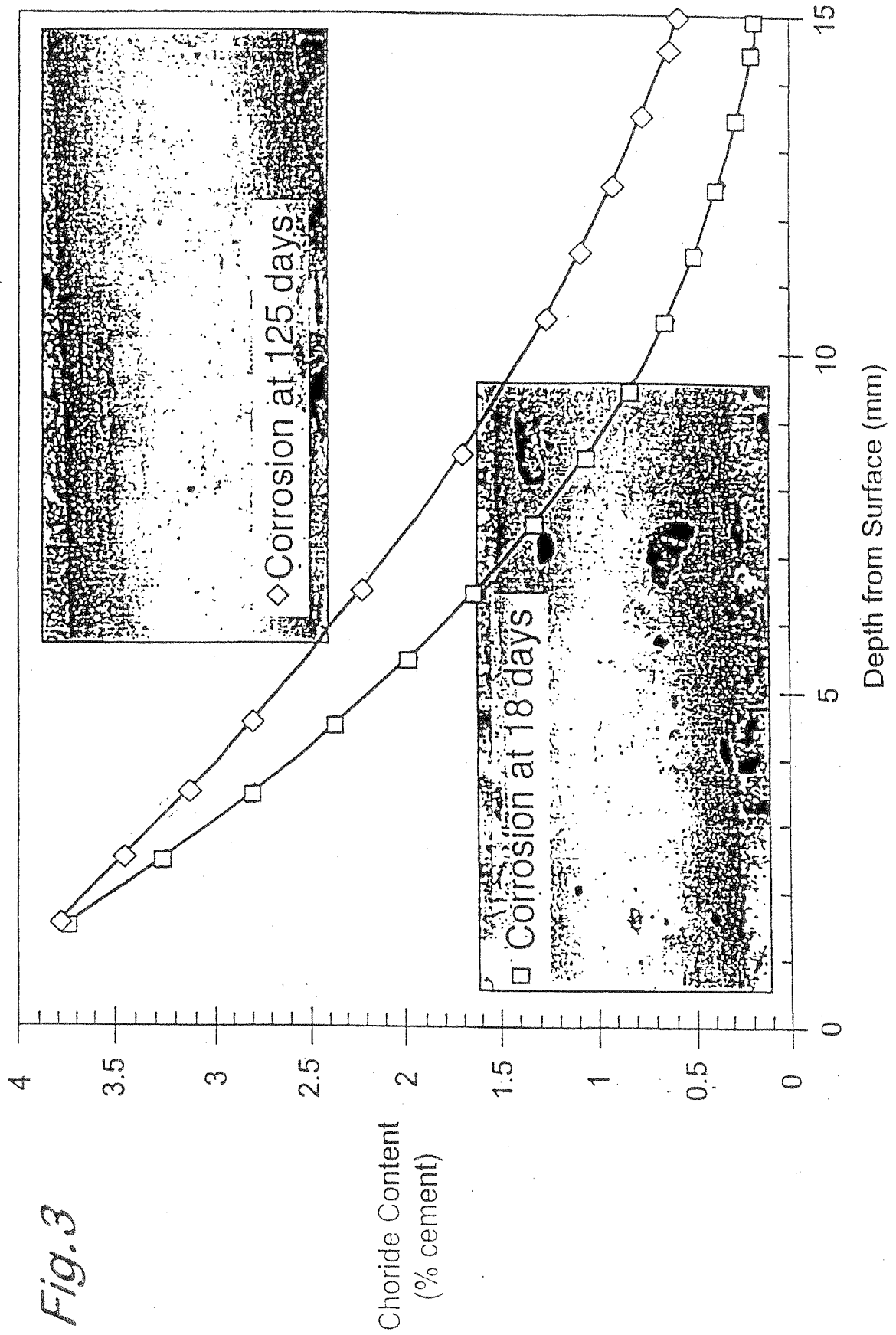


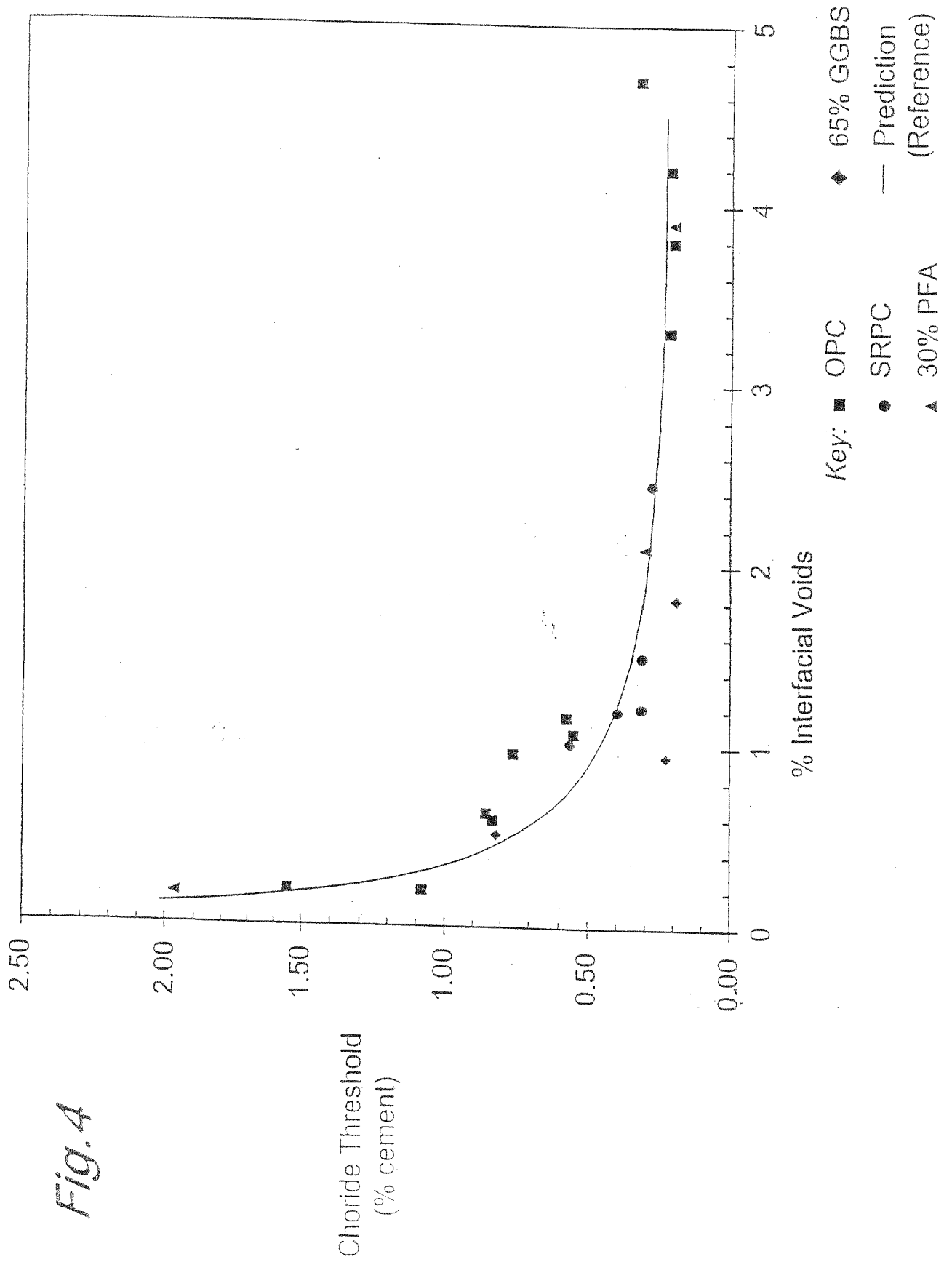
Fig. 1



2/11







Effect on chloride threshold level of applying electrochemical treatments on setting and hardened concrete.

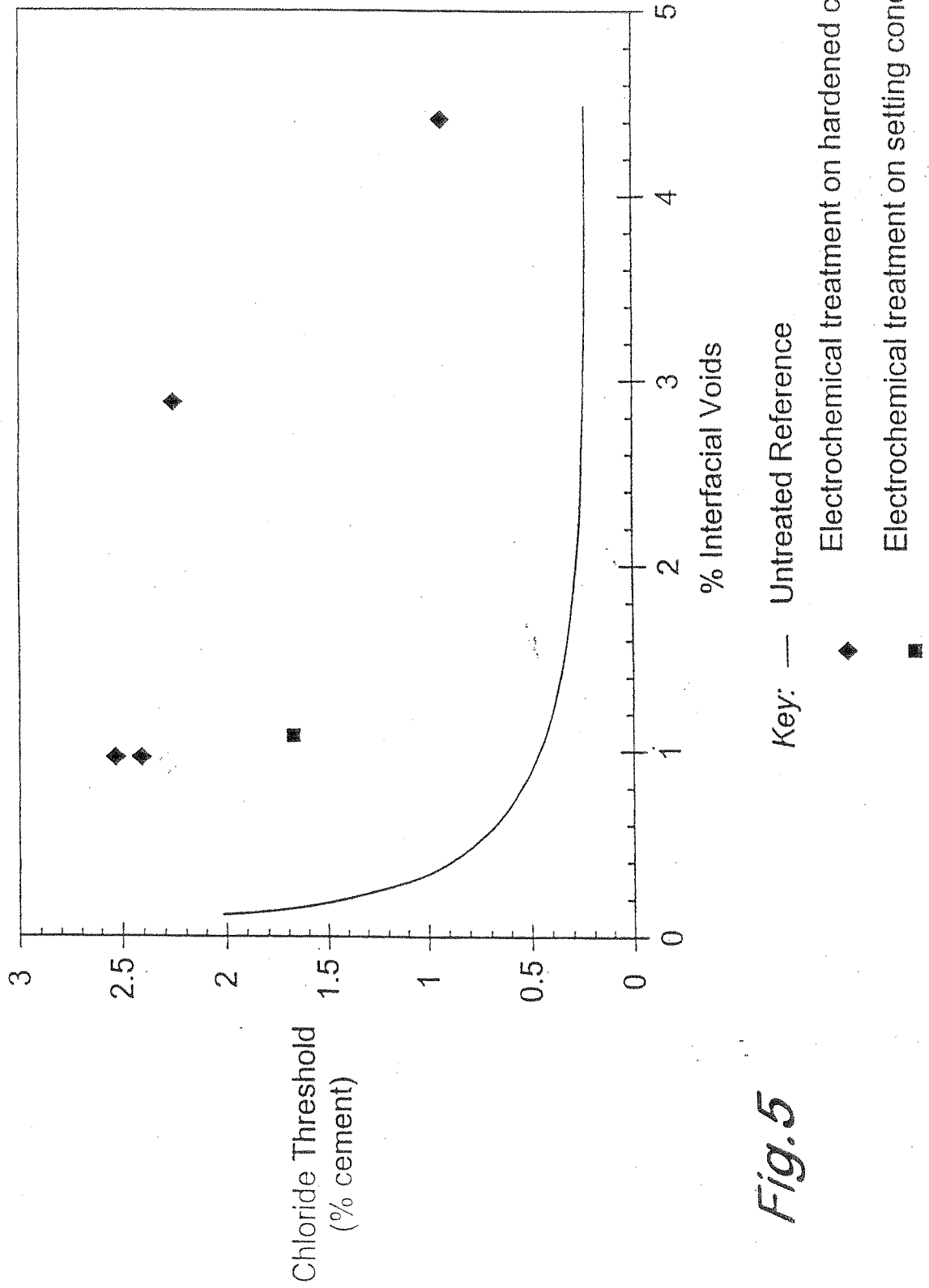
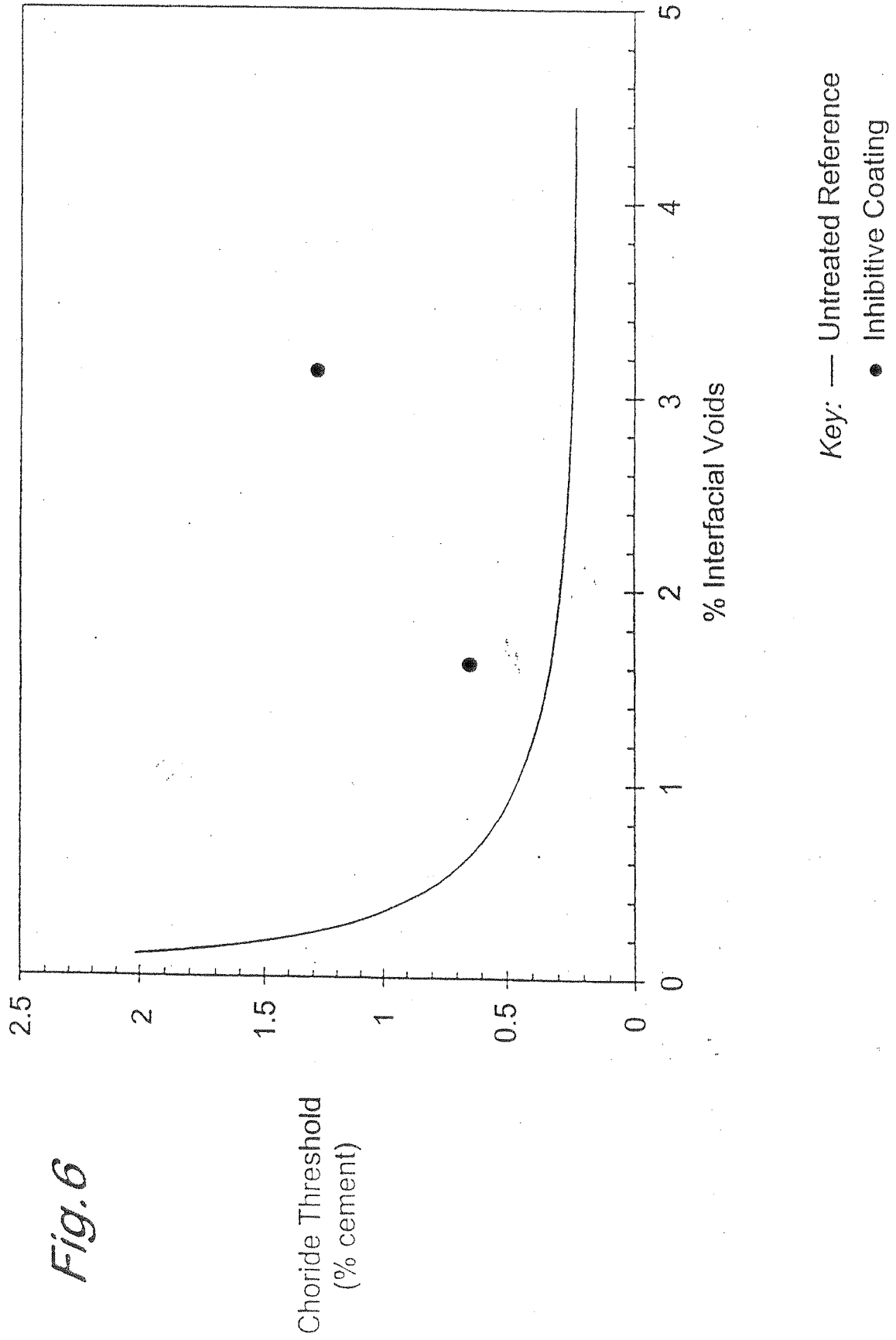
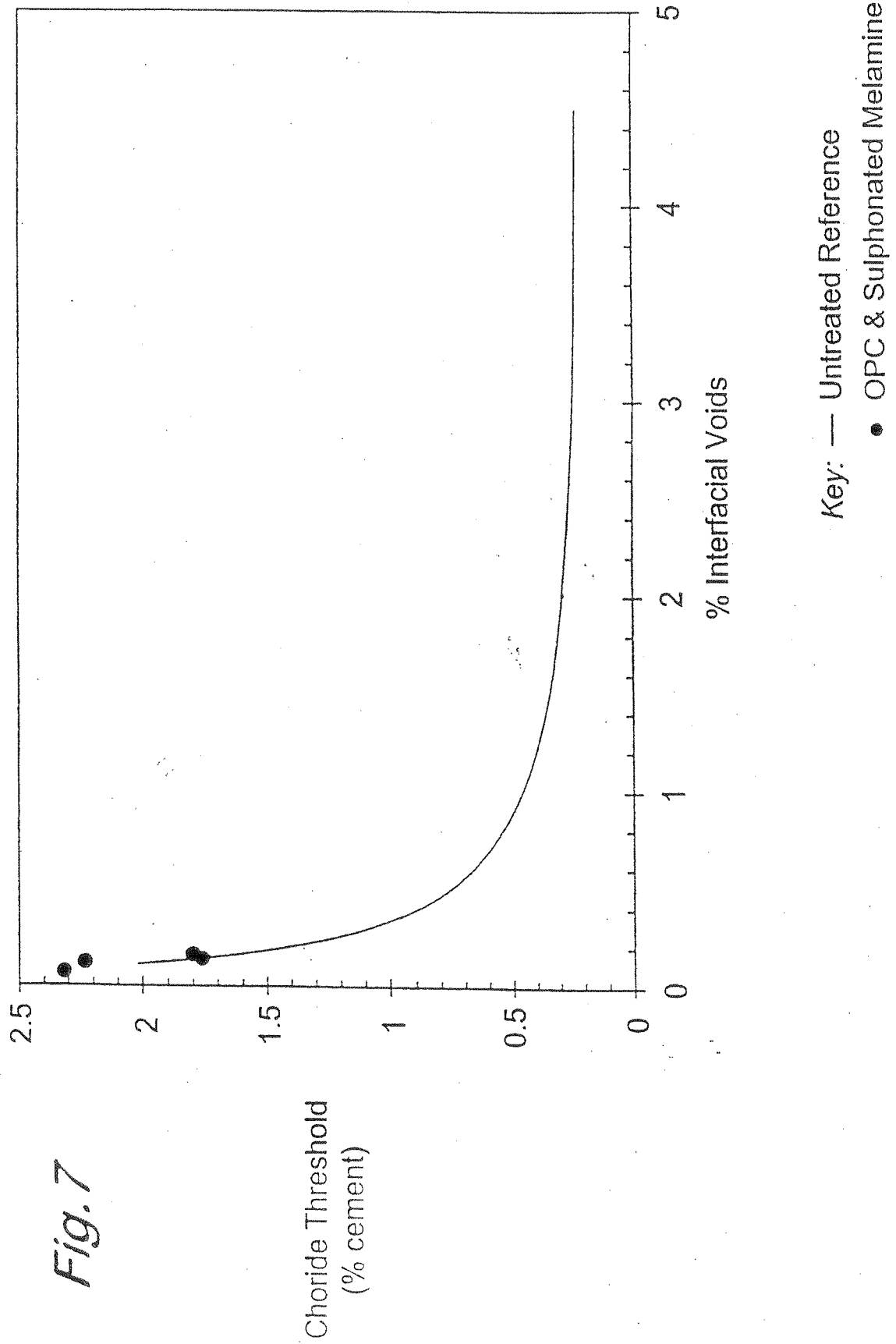


Fig. 5





OPC concrete (no admixtures) and plain steel (PS1)

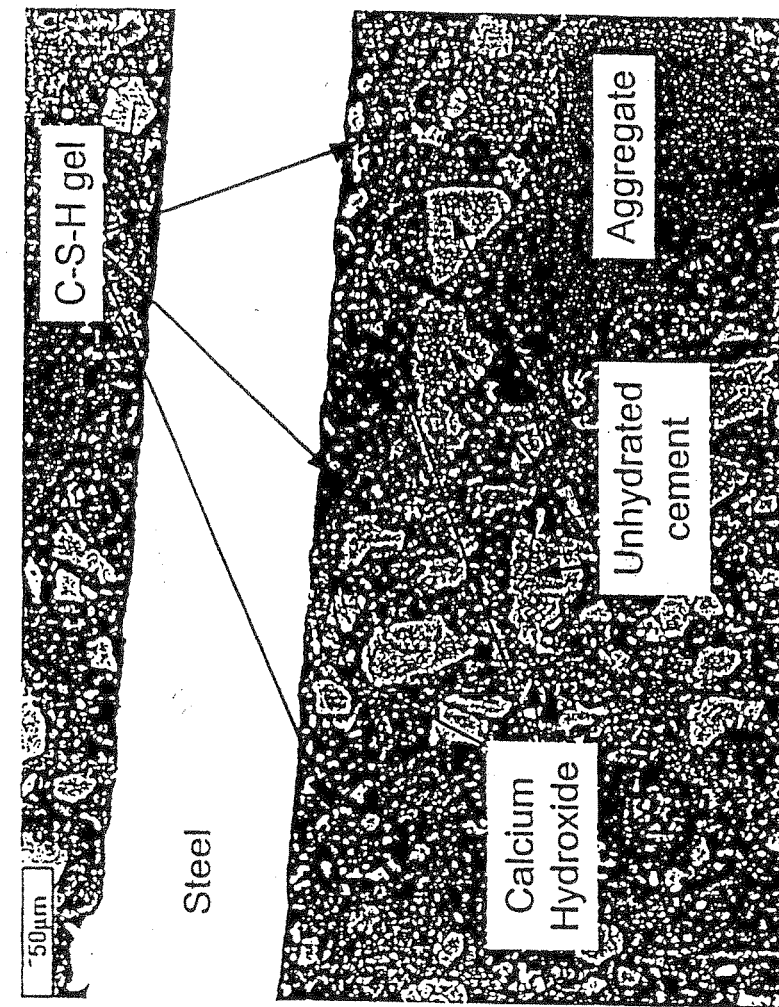
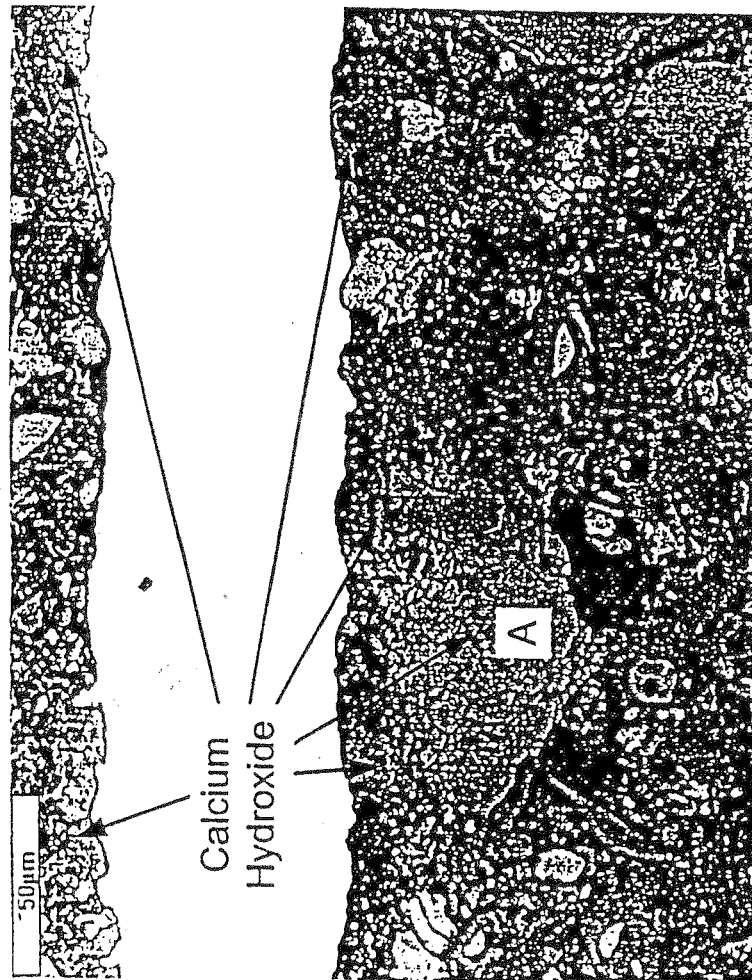


Fig.8

A backscattered electron image obtained in the scanning electron microscope of polished section through steel in concrete. The grey scales in these images depends on the electron density of the material. The phases of interest, graded in terms of their brightness, are the steel (lightest) > unhydrated cement grains > calcium hydroxide (CH) > gel (predominantly calcium silicate hydrate (C-S-H) ~ aggregate > porosity and voids (darkest). There is no general indication of any preferential formation of calcium hydroxide at the steel.

$\text{Ca}(\text{NO}_3)_2$ solution coating (CT1-1)

Fig. 9



A backscattered electron image obtained in the scanning electron microscope of polished section through steel in concrete. The steel was coated with a saturated solution of calcium nitrate which was then oven dried. There is a general indication that more calcium hydroxide forms in the vicinity of the steel. The feature marked A is relatively pure (free of silica contamination) and may have resulted from the reaction of a crystal of calcium nitrate with the pore solution of the hydrating cement.

Electrochemically treated concrete with $\text{Ca}(\text{NO}_3)_2$ admixture (ETC1-2)

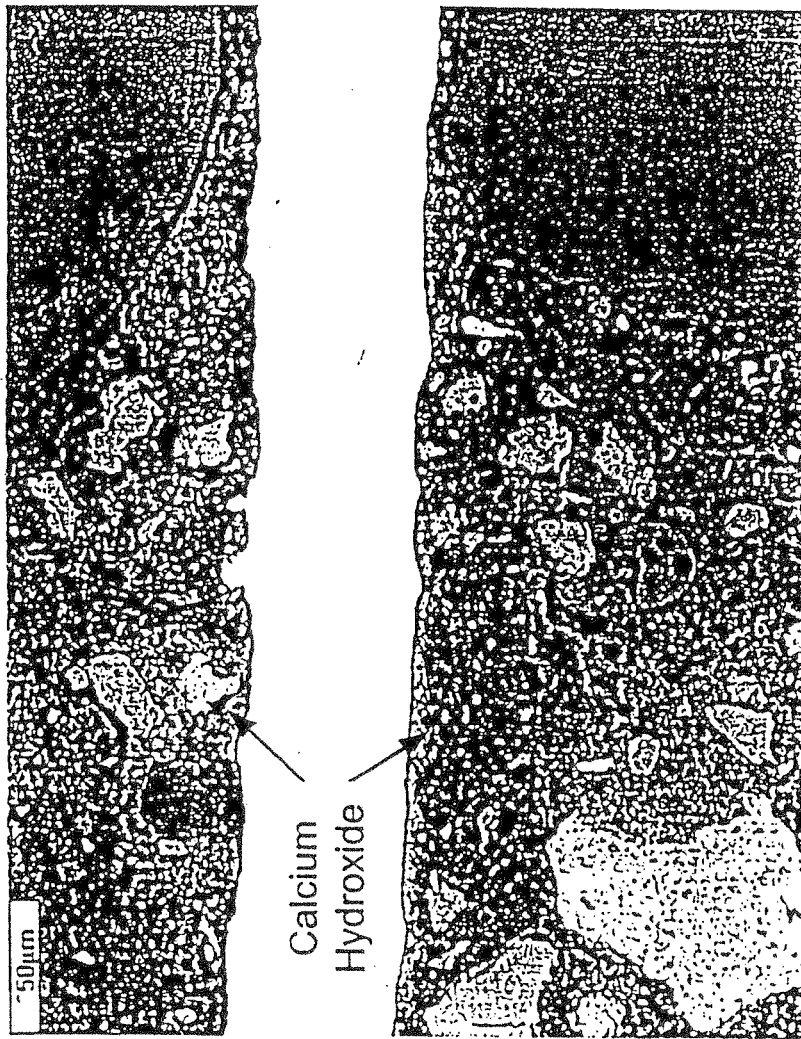
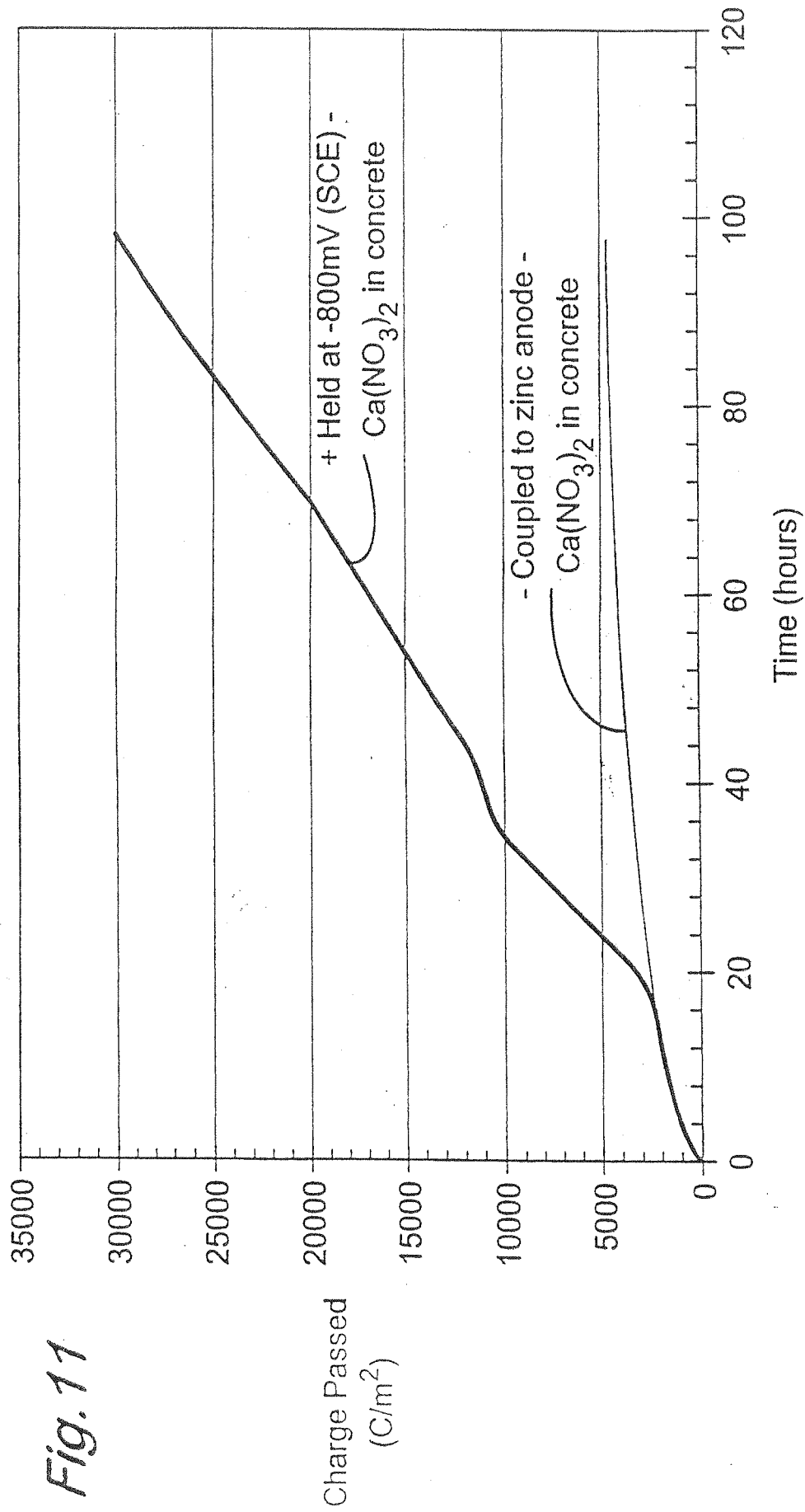


Fig. 10

A backscattered electron image obtained in the scanning electron microscope of polished section through steel in concrete. The concrete contained 5% calcium nitrate by weight of cement. A current was passed to the steel while the concrete was setting and curing. There is a clear indication of a layer of calcium hydroxide on the steel. Note there is also generally more calcium hydroxide in the cement paste.



Charge passed to electrochemically treated specimen held at -800mV (SCE) (ETC1-2) compared with charge passed when coupled to a zinc anode placed directly in the concrete.