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Nonpolarisable Electrodes for Geophysical Applications

Models AMT-07-b, AMT-07-c. AMT-07-d, HS Code 90159000

Characteristics:

1) The Ag/AgCl half-cell (small disk in the cylinder with the measuring lead is **sensitive to light** (see Fig. 1). Exposure to UV light will lead to a darkening of the outer surface of the half-cell. This does not usually adversely affect the performance of the electrode. If desired, the darkened surface can easily be removed by light sanding with fine non-metallic sandpaper (Fig. 2). Stripping or cleaning with chemical agents should not be attempted as this may seriously degrade the performance of the half-cell.

Figure 1: A proper outer surface of the Ag/AgCl half-cell.

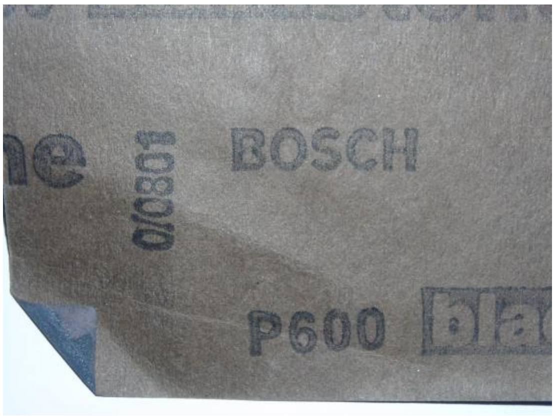

Figure 2: Fine (P600) grained sand paper to clean the outer surface of the Ag/AgCl half-cell.

Damaged or degraded outer surface of the Ag/AgCl half-cell can be easily identified. Figure 3 shows the case when the sealing of the electrode is broken and the copper wire starts to corrode.

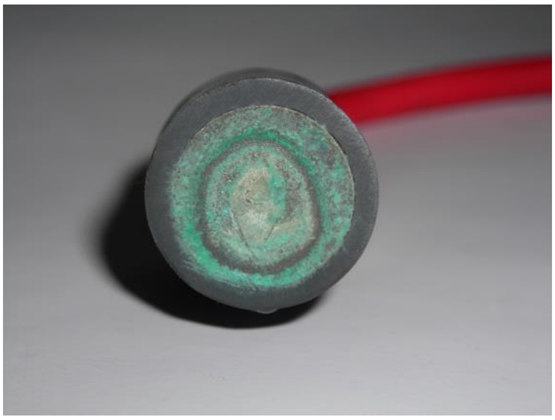

Figure 3: Broken sealing of the Ag/AgCl half-cell causes corrosion of the lead wire. This Ag/AgCl half-cell is permanently damaged.

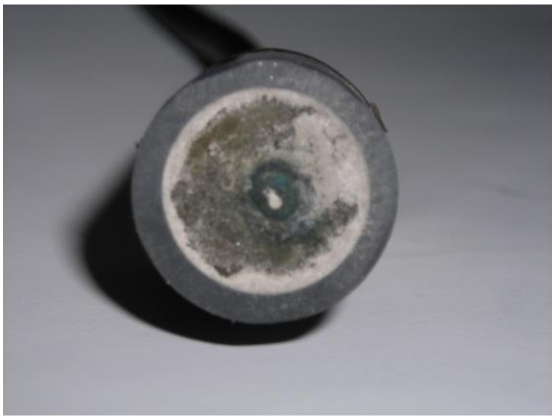

Figure 4: Damaged Ag/AgCl half-cell caused by chemical agents. This Ag/AgCl half-cell is permanently damaged.

2) You can use **environmental friendly** saturated NaCl or KCl solution (*3.5 M KCl or 3M NaCl*) as shown in Figure 5. Various working groups use e.g. electrolyte based on 28g/l NaCl (normal salt) in demineralised water from the supermarket. If you use contaminated water enhanced with e.g. with chemical agents this may seriously degrade the performance of the half-cell and might lead to a damage of the surface (see Fig. 4).

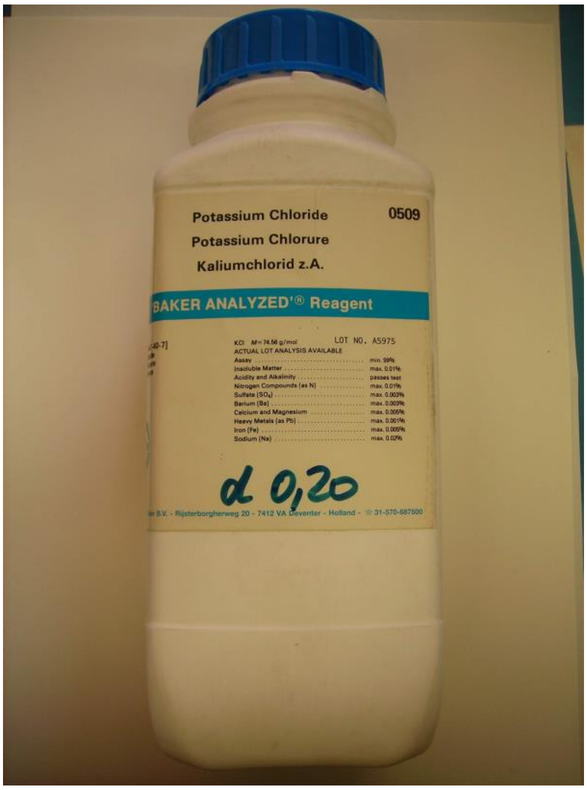

Figure 5: KCl salt to prepare the electrolyte

3) Strong electrolytes, such as saturated KCl, may pit the half-cell surface. This can be minimized by adding a few grains of silver chloride to the electrolyte.

4) To achieve stable potentials, presoak the Ag/AgCl half-cells (in pairs with their leads shorted to each other) in a chloride containing electrolyte for some hours (4-7h) before using them in the field (Fig. 6). After approximately 4-7 h the half cells should show at constant temperature a stable potential in the mV range.

Figure 6: Presoaking of the Ag/AgCl half-cell

Figure 7: Storage of the electrodes during field work.

5) Measuring the contact resistivities between two electrodes, e.g. when placed in the ground or in an electrolyte bath, will degrade the electrode (cathode (-) and anode (+)). **You will irreversible harm the Ag/AgCl electrode**. Do not use these electrodes to inject currents!

6) After use, rinse the half-cell with distilled water, blot dry and store the in the dark and also cleaned PVC electrolyte chamber. Do not miss to remove any bottom-crust from the inner electrolyte chamber. The electrolyte chamber has four ceramic inlets (Fig. 8) to create the electrolytic contact between the Ag Ag/AgCl halfcell and the ground. In soils with many pebbles or other rocks it may happened that the ceramic inlet is mechanically damaged. This will cause the electrode to dry out very fast. You can use a two component glue to seal in a spare ceramic inlet (Fig. 9). Do not miss to clean the electrode after use. If you do not take care, massive salt flowering at the ceramic inlet might happen as shown in Fig. 10.

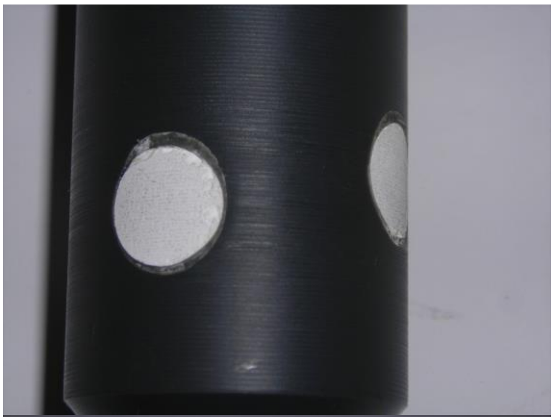

Figure 8: Ceramic inlet of the electrode

Figure 9: Repair of the ceramic inlet

Figure 10: A salt crust on the electrode

7) A common problem in arid climate areas is the drying out of the electrode. You have two options to cope with this problem: i) use Bentonite to create a wet bedding of your electrode in the subsurface. ii) use NUTILIS to create a gel–like electrolyte (Fig. 11)

Figure 11: Nutilis

Safety Data Sheet for electrode models AMT-07-x
Sicherheitsdatenblatt zur Eigenpotentialsonde AMT-07-x

The entire electrode is manufactured from **environmental friendly** PVC.
The porous ceramic inlets are made from **environmental friendly** aluminiumsilicat.
The Ag/AgCl electrode is based on a thin Ag/AgCl semiconductor with an adhesive bonded silver wire at the back to which a cupper measuring lead is soldered. The complete system is then seawater resistant sealed with a 2 component adhesive in a PVC cylinder.

Die Eigenpotentialsonde ist durchweg aus **umweltunbedenklichem** PVC hergestellt.
Die poröse Keramik besteht aus **umweltunbedenklichem** Aluminiumsilikat.
Die Ag/AgCl Elektrode besteht aus einem dünnen Ag/AgCl Halbleiter Pellet mit rückseitig angesetztem Silberfädchen. An dem Silberfädchen ist die isolierte Kupfer Messleitungen verlötet. Das ganze System ist dann mithilfe eines 2 Komponenten Epoxyd-Klebers in einem PVC Zylinder seewasserfest verklebt.

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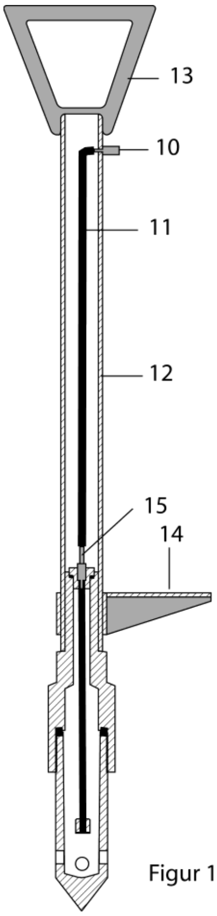

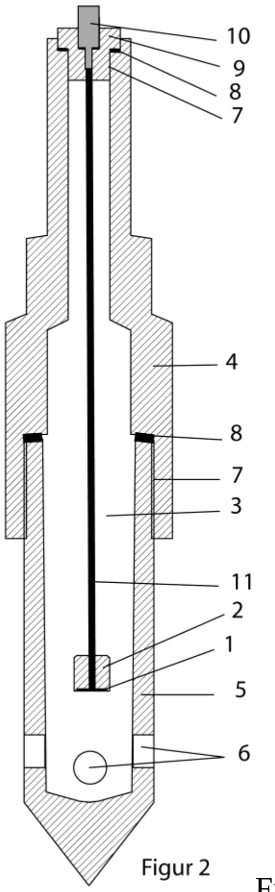

Figur 1: Self-Potential measuring system

Figur 2: AMT-07b Ag/AgCl Sonde

1: Ag/AgCl halfcell

4, 5: electrolyte chamber

6: ceramic inlets