

SynthesisCell QUICK-START GUIDE

Congratulations on your purchase of the Antec SynthesisCell™ (pn 206.0035 or 206.0037), a bulk electrochemical cell, designed for small-scale electrosynthesis of metabolites, reactive intermediates and other oxidation and reduction products in milligram quantities. The SynthesisCell is available with different working electrodes (WE): Reticulated Glassy Carbon (RGC), Smooth Glassy Carbon (SGC), Magic Diamond (MD) and Platinum (Pt). The SynthesisCell is standard delivered with a Pd/H₂ (HyREF) reference electrode, but also an optional salt-bridge Ag/AgCl electrode (pn 206.0314) is available. A coiled platinum wire is used as an auxiliary electrode (AUX).

Note that this document is not a replacement of the user manual (pn 206.0010). Please consult the user manual and instruction movies for detailed information:

- <http://www.antecscientific.com/support/docs-and-downloads/user-manuals>
- <http://www.antecscientific.com/support/maintenance-videos/synthesiscell-instructions>



Figure 1. Synthesis Cell with Reticulated Glassy Carbon WE electrode (RGC).



This hardware should be used by trained laboratory personnel only. Use proper eye and skin protection when working with solvents. Additional safety requirements or protection may be necessary depending on the chemicals used in combination with this equipment. Make sure that you understand the hazards associated with the chemicals used and take appropriate measures with regards to safety and protection.

The SynthesisCell is delivered pre-assembled however some foam packaging protection for safe transportation must be removed before use.



Never switch ON the flow cell when:

- the cell cable is not correctly connected
 - the cell is not filled with buffer/electrolyte
- because substantial damage to the working electrode or electronics may occur.**

Preparations

1. Take the SynthesisCell from the shipping box and remove the protecting foam parts.
2. Prepare a solution containing the substance(s) and a supporting electrolyte: ammonium formate (10 – 20 mM), formic acid or acetic acid, (0.1 - 1% in water).
3. Download and install the latest version of Dialogue software:
<http://www.antecscientific.com/support/documents-and-downloads/download-software>

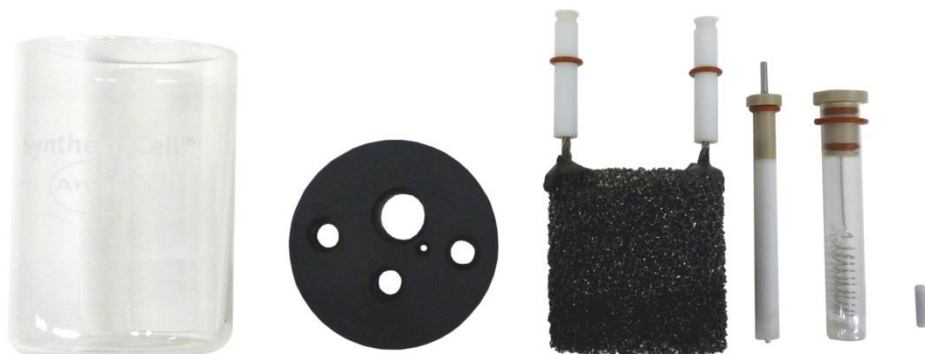


Figure 2. Photo of a disassembled SynthesisCell. From Left to right: (1) Glass reaction vessel, (2) Vessel cap, (3) Reticulated Glassy Carbon WE (RGC), (4) H₂/Pd reference electrode (HyREF), (5) Pt AUX electrode and (6) Teflon stirrer bar. Note the small ID port next to the AUX port (bottom-right side), this is an additional port for gas purging or sampling (use 1/16" OD PTFE, FEP or PEEK tubing for this purpose). The AUX electrode is delivered with an additional glass tube without frit.

Assembling the SynthesisCell

See figure 1 on page 1 for reference and watch the installation movies on the Antec support site:

4. Fill the glass reaction vessel with a solution containing electrolyte(s) and electro-active compound. The maximum allowed volume is 80mL. Put the stirrer in the vessel.
5. Place the vessel cap on the WE and fix the WE position (height) with the retaining rings.
6. Place the WE in the vessel. Adjust the position of the WE if needed by careful pushing or pulling the white Teflon contacts. The RGC WE is **fragile and must be handled with care**. Keep the wires connecting the WE with the Teflon tubes dry.
7. Place the AUX electrode in the fritted glass tube and mount it in the vessel cap. The AUX tube should be filled with mobile phase which takes a minute. The fritted glass tube keeps the AUX separated from the WE, reaction products on both electrodes are not mixed. An additional tube without frit is available for cases where the mixing of products is allowed.
8. Place the HyREF in the vessel cap and the SynthesisCell is ready-to-use.

Operation

9. Place the SynthesisCell on the magnetic stirrer and adjust the rotation.
10. Connect the cell cable as shown in the figure on the right hand side. Red: WE, blue: AUX and black: REF.
11. Set the measurement conditions using Dialogue. The user manual (210.7017 – Dialogue for ROXY) is available on our website.
12. The reaction is started as soon as the SynthesisCell is started. Depending on the substance(s) and the applied potential, the cell current (I-Cell) can go up to 2 – 20 mA.
13. Monitor the formation of product by taking aliquots from the vial through the sampling port.
14. A 0.1 mmol/L (1.5 mg) MOPEG solution is for 90% converted in about 40 min under optimized conditions.
15. When finished, switch off the cell and collect the solution in another vial. When mixing of electrode solutions is not allowed, first take out the AUX to prevent mixing.
16. Follow the cleaning procedure as described in the user manual (pn 206.0010).



Disassembling the SynthesisCell

1. Switch off the cell and disconnect the cell cable.
2. Remove the AUX and the HyREF.
3. To remove the WE. Gently push the WE downwards using the white Teflon contacts, then pull it up to remove the retaining rings. Gently rest the WE on the bottom of the cell. Remove the vessel cap, and remove the WE from the vessel.