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Best Practice for Shutting Down a CO₂ Incubator

Background

With the emergence of the SARS-CoV-2 virus and the associated COVID-19 pandemic, many research institutes are reducing work or even temporarily closing their facilities. For cell culture laboratories, this requires not just halting experiments and freezing cultured cells, but also taking care in properly switching off and putting laboratory equipment in hibernation.

Because CO₂ incubators are designed to grow cultured animal cells, they are also expert at growing associated normal flora and opportunistic microorganisms. As a result, it is very important to take a little extra time to ensure that an inactive CO₂ incubator will not spend the quiet time growing such microorganisms. It would be terrible to return to the lab after a weeks-long hiatus to find the incubators full of mold or other fungi and bacteria.

Here we provide our best practice for shutting down a CO₂ incubator for a period of weeks or even months. These tips are designed to avoid the growth of microorganisms in an empty, closed CO₂ incubator which was previously in use.

Procedure for Shutdown of CO₂ incubator

1. Switch off the incubator power and disconnect the power cord from the power supply/wall outlet. Coil the cord and secure it.
2. Close the valve for the CO₂ gas supply. If the gas comes from a building supply unit, there should be a valve on the wall near the incubator. If the gas comes from a portable gas canister, close the valve on the canister.
3. Remove/empty the water from the humidity reservoir and discard the water. Ensure the water reservoir is completely empty and wipe dry.
4. Depending on the length of time that the incubator will be inactive, consider removing the in-chamber HEPA filter and discarding.
5. Clean the incubator interior and exterior with mild dish soap and water. Clean the incubator shelves, shelf standards and parts, and the water reservoir. Rinse with clear sterilized distilled water and wipe dry using a clean, lint free towel.
6. Spray the interior and parts with 70% ethanol and allow to air dry.
7. Close the incubator door securely.

Procedure for Restart of CO₂ incubator

1. Refer to the user manual for the specific model.
2. If the incubator has been idle for six months to one year, consider replacing the gas line air filters.
3. Clean the incubator exterior. Inspect the interior; it should be clean if the incubator has been unopened while idle, but if the incubator chamber has become dirty, clean as in step 5 of the shutdown procedure.
4. Spray the interior with 70% and allow to air dry.
5. If available, initiate the automated heat sterilization cycle, following the instructions in the user manual.
6. Following the sterilization, install a new HEPA filter if necessary.
7. Program the desired settings for temperature and CO₂ concentration. Fill the water reservoir with fresh sterilized distilled water.
8. If available, initiate the "Auto-Start" cycle.
9. After 24 hours of operation, confirm the CO₂ concentration using a handheld sensor such as a fyrite or handheld CO₂ sensor.
10. The incubator is now ready to receive cultured cells.

References

1. Thermo Scientific Technical Note. Proper care and maintenance for a cell culture incubator. Thermo Fisher Scientific TNCO2CARE 1217, 2017.
2. Thermo Scientific Smart Note. How can using the wrong type of water to provide in-chamber humidity cause corrosion in my CO₂ incubator? Thermo Fisher Scientific SNCO2WATER 0316, 2016.