# Toxic or flammable gas cylinder in a fume hood

Table 10-4

| **Department: Chemistry** | **Description of Operation:**  **Use of toxic or flammable gas in small cylinder in fume hood** | | | **By:**  **Review Team Date 7/12** |
| --- | --- | --- | --- | --- |
| **What if?** | **Answer** | **Probability** | **Consequences** | **Recommendations** |
| Power to exhaust fan is lost | Possible exposure to toxic gas if gas flow continues | Very high | Serious | Provide emergency power and normally closed gas valve |
| Mechanical failure of exhaust fan? | Same as above | Moderate | Serious | Same as above and consider connection to multiple fans |
| Regulator fails or creeps, and allows full cylinder pressure to apparatus | Apparatus or tubing failure and gas release if not able to handle full cylinder pressure | Low | Serious | Use flow restricting orifice in cylinder valve to limit flow or install excess flow shutoff valve; consider gas monitor that is interlocked to shut down gas flow |
| Cylinder regulator gauge blows | High pressure gas release and possible exposure | Low | Serious | Same as above |
| Gas leak downstream of regulator; hood face at 18 inches | Lower pressure gas release but potential exposure which increases with gas flow rate | Moderate | Serious | Same as above |
| Gas leak downstream of regulator; hood face at 30 inches with operator at hood | Same as above but high potential for exposure | Moderate | Serious | Same as above and restrict hood opening while gas flowing via interlock, or stop and consider use of a self-contained breathing apparatus (SCBA) if access during flow is necessary |
| Cylinder contains wrong contents | Potential exothermic reaction or if not, ruined experiment and apparatus | Low | Serious | Check cylinder tag, not just cylinder stencil |
| Cylinder pressure is incorrect | Regulator gauge could fail; rapid release of high pressure gas | Low | Serious | Same as above (see also <https://www.aiha.org/get-involved/VolunteerGroups/LabHSCommittee/Pages/Compressed-Gas-Incidents.aspx> (accessed March 9, 2015)) |
| Apparatus contains oxygen when gas is introduced | Explosion potential if gas hits flammable range and ignition source is present | Moderate | Serious | Assure purge with inert gas before introducing flammable gas if ignition source may be present (consider automation) |
| Residual process gas in equipment when opened | Potential exposure to toxic gas | Moderate | Serious | Same as above; test atmosphere or use SCBA |

This file is excerpted from “Identifying and Evaluating Hazards in Research Laboratories: Guidelines developed by the Hazard Identification and Evaluation Task Force of the American Chemical Society’s Committee on Chemical Safety”.

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