WHAT IS CLAIMED IS:

1. A valve system comprising:

a control valve;

a valve assembly that operates to open and close the control valve;

a lock-ring; and

a valve position indicator including a valve open/close indicator,

wherein the valve open/close indicator is located on a top of the valve assembly, or a bottom of the valve assembly, or both a top of the control valve and a side of the valve assembly; and

wherein the valve position indicator is in threaded engagement with a body of the valve assembly and securely locked in alignment with a position of the control valve by the lock-ring, and wherein the lock-ring connects to the valve position indicator.

2. The valve system of claim 1, further comprising a gas cylinder coupled to the valve system.

3. The valve system of claim 2, wherein the gas cylinder comprises:

an interior volume;

a reagent gas within the internal volume; and

an exterior pressure surface.

4. The valve system of claim 2, wherein the gas cylinder comprises:

an interior volume;

an adsorbent within the interior volume, the adsorbent having sorptive affinity for a reagent gas, to contain sorptive gas as adsorbed reagent gas on the adsorbent in equilibrium with gaseous sorptive gas at the interior volume;

a gaseous fluid flow port; and

an exterior surface.

5. The valve system of claim 4, wherein the adsorbent is selected from a material comprising one or more of carbon, activated carbon, zeolite, porous organic polymers, and metal organic framework.

6. The valve system of claim 4, wherein the adsorbent is capable of adsorbing gas selected from silane, diborane, arsine, phosphine, chlorine, boron trichloride, boron trifluoride, B_2H_6, tungsten hexafluoride, trimethyl stibine, hydrogen fluoride, hydrogen chloride, hydrogen iodide, hydrogen bromide, germane, ammonia, stibine, hydrogen sulfide, hydrogen selenide, hydrogen telluride, GeF_4, SiF_4, NF_3, silane, methyl silane, trimethyl silane, hydrogen, methane, nitrogen, carbon monoxide, bromine, iodine, and fluorine organometallic compounds, AsF_5, hydrocarbons, and organometallic compounds, including all isotopes.

7. The valve system of claim 2, wherein the gas cylinder is a pressure-regulated cylinder comprising:

an interior volume;

at least one reagent gas in the interior volume;

one or more pressure regulators; and

an exterior surface.

8. The valve system of claim 7, wherein the at least one reagent gas is a gas selected from silane, diborane, arsine, phosphine, chlorine, boron trichloride, boron trifluoride, B_2H_6, tungsten hexafluoride, trimethyl stibine, hydrogen fluoride, hydrogen chloride, hydrogen iodide, hydrogen bromide, germane, ammonia, stibine, hydrogen sulfide, hydrogen selenide, hydrogen telluride, GeF_4, SiF_4, NF_3, silane, methyl silane, trimethyl silane, hydrogen, methane, nitrogen, carbon monoxide, bromine, iodine, and fluorine organometallic compounds, AsF_5, hydrocarbons, and organometallic compounds, including all isotopes.

9. The valve system of claim 7, wherein the gas cylinder comprises two or more reagent gases.

10. The valve system of claim 9, wherein the two or more reagent gases comprises at least one dopant source gas, a diluent gas source, and optionally a supplemental gas source.

11. The valve system of claim 10, wherein the at least one dopant gas source is selected from eBF_3, $eGeF_4$, CO, CO_2, GeF_4, B_2H_6, and eB_2H_6.

12. The valve system of claim 10, wherein the diluent gas source is hydrogen.

13. A valve system comprising:

a control valve;

a valve assembly that operates to open and close the control valve;

an indicator locking mechanism including a slotted attachment; and

a valve position indicator including a valve open/close indicator,

wherein the valve open/close indicator is located on a top of the valve assembly, or a bottom of the valve assembly, or both a top of the control valve and a side of the valve assembly; and

wherein the valve position indicator is in threaded engagement with a body of the valve assembly and is locked in alignment with a position of the control valve by the slotted attachment of the indicator locking mechanism.

14. The valve system of claim 13, further comprising a gas cylinder coupled to the valve system,

wherein the gas cylinder comprises:

an interior volume;

a reagent gas within the interior volume; and

an exterior pressure surface.

15. The valve system of claim 13, further comprising a gas cylinder coupled to the valve system,

wherein the gas cylinder comprises:

an interior volume;

an adsorbent within the interior volume, the adsorbent having sorptive affinity for a reagent gas, to contain sorptive gas as adsorbed reagent gas on the adsorbent in equilibrium with gaseous sorptive gas at the interior volume;

a gaseous fluid flow port; and

an exterior surface;

wherein the adsorbent is selected from a material comprising one or more of carbon, activated carbon, zeolite, porous organic polymers, and metal organic framework; and

wherein the adsorbent is capable of adsorbing gas selected from silane, diborane, arsine, phosphine, chlorine, boron trichloride, boron trifluoride, B_2H_6, tungsten hexafluoride, trimethyl stibine, hydrogen fluoride, hydrogen chloride, hydrogen iodide, hydrogen bromide, germane, ammonia, stibine, hydrogen sulfide, hydrogen selenide, hydrogen telluride, GeF_4,

SiF_4, NF_3, silane, methyl silane, trimethyl silane, hydrogen, methane, nitrogen, carbon monoxide, bromine, iodine, and fluorine organometallic compounds, AsF_5, hydrocarbons, and organometallic compounds, including all isotopes.

16. The valve system of claim 13, further comprising a gas cylinder coupled to the valve system,

wherein the gas cylinder is a pressure-regulated cylinder comprising:

an interior volume;

at least one reagent gas in the interior volume;

one or more pressure regulators; and

an exterior surface;

wherein the at least one reagent gas comprises a gas selected from silane, diborane, arsine, phosphine, chlorine, boron trichloride, boron trifluoride, B_2H_6, tungsten hexafluoride, trimethyl stibine, hydrogen, hydrogen fluoride, hydrogen chloride, hydrogen iodide, hydrogen bromide, germane, ammonia, stibine, hydrogen sulfide, hydrogen selenide, hydrogen telluride, GeF_4, SiF_4, NF_3, silane, methyl silane, trimethyl silane, hydrogen, methane, nitrogen, carbon dioxide, carbon monoxide, bromine, iodine, and fluorine organometallic compounds, AsF_5, hydrocarbons, and organometallic compounds, including all isotopes.

17. A valve system comprising:

a control valve;

a valve assembly that operates to open and close the control valve;

a lock-ring; and

a valve position indicator including a valve open/close indicator,

wherein the valve open/close indicator is located on a top of the valve assembly, or a bottom of the valve assembly, or both a top of the control valve and a side of the valve assembly, and

wherein the valve position indicator is in threaded engagement with a body of the valve assembly and securely locked in alignment with a position of the control valve by the lock-ring, and

wherein the valve open/close indicator includes:

a first sleeve; and

a second sleeve moveable relative to the first sleeve for changing the valve open/close indicator from indicating a closed valve to indicating an open valve.

18. The valve system of claim 17, further comprising a gas cylinder coupled to the valve system,

wherein the gas cylinder comprises:

an interior volume;

a reagent gas within the interior volume; and

an exterior pressure surface.

19. The valve system of claim 17, further comprising a gas cylinder coupled to the valve system,

wherein the gas cylinder comprises:

an interior volume;

an adsorbent within the interior volume, the adsorbent having sorptive affinity for a reagent gas, to contain sorptive gas as adsorbed reagent gas on the adsorbent in equilibrium with gaseous sorptive gas at the interior volume;

a gaseous fluid flow port; and

an exterior surface;

wherein the adsorbent is selected from a material comprising one or more of carbon, activated carbon, zeolite, porous organic polymers, and metal organic framework; and

wherein the adsorbent is capable of adsorbing gas selected from silane, diborane, arsine, phosphine, chlorine, boron trichloride, boron trifluoride, B_2H_6, tungsten hexafluoride, trimethyl stibine, hydrogen fluoride, hydrogen chloride, hydrogen iodide, hydrogen bromide, germane, ammonia, stibine, hydrogen sulfide, hydrogen selenide, hydrogen telluride, GeF_4, SiF_4, NF_3, silane, methyl silane, trimethyl silane, hydrogen, methane, nitrogen, carbon monoxide, bromine, iodine, and fluorine organometallic compounds, AsF_5, hydrocarbons, and organometallic compounds, including all isotopes.

20. The valve system of claim 17, further comprising a gas cylinder coupled to the valve system,

wherein the gas cylinder is a pressure-regulated cylinder comprising:

an interior volume;

at least one reagent gas in the interior volume;

one or more pressure regulators; and

an exterior surface;

wherein the at least one reagent gas comprises a gas selected from silane, diborane, arsine, phosphine, chlorine, boron trichloride, boron trifluoride, B_2H_6, tungsten hexafluoride, trimethyl stibine, hydrogen, hydrogen fluoride, hydrogen chloride, hydrogen iodide, hydrogen bromide, germane, ammonia, stibine, hydrogen sulfide, hydrogen selenide, hydrogen telluride, GeF_4, SiF_4, NF_3, silane, methyl silane, trimethyl silane, hydrogen, methane, nitrogen, carbon dioxide, carbon monoxide, bromine, iodine, and fluorine organometallic compounds, AsF_5, hydrocarbons, and organometallic compounds, including all isotopes.