CLAIMS:

1. A method for separating fluids, comprising:

exposing an input fluid stream comprising a first fluid component and a second fluid component to an adsorbent comprising zeolite ITQ-55 to form a rejection product fluid stream, a molar ratio of the first fluid component to the second fluid component in the rejection product fluid stream being less than a molar ratio of the first fluid component to the second fluid component in the input fluid stream;

collecting the rejection product fluid stream;

forming an adsorbed product fluid stream, a molar ratio of the first fluid component to the second fluid component in the adsorbed product stream being greater than the molar ratio of the first fluid component to the second fluid component in the input fluid stream; and

collecting the adsorbed product stream,

wherein the zeolite ITQ-55 has a framework of tetrahedral (T) atoms connected by bridging atoms, wherein the tetrahedral atom is defined by connecting the nearest T atoms in the manner described in the following Table:

ITQ-55 tetrahedral atom interconnections

T atom	Connected to:
T1	T6, T7, T55, T73
T2	T3, T5, T9, T56
T3	T2, T7, T21, T27
T4	T8, T9, T58, T73
T5	T2, T8, T52, T59
T6	T1, T8, T53, T60
T7	T1, T3, T50, T61
T8	T4, T5, T6, T51
T9	T2, T4, T21, T63
T10	T15, T16, T64, T74
T11	T12, T14, T18, T65
T12	T11, T16, T30, T36
T13	T17, T18, T67, T74
T14	T11, T17, T43, T68

T15	T10, T17, T44, T69
T16	T10, T12, T41, T70
T17	T13, T14, T15, T42
T18	T11, T13, T30, T72
T19	T24, T25, T37, T73
T20	T21, T23, T27, T38
T21	T3, T9, T20, T25
T22	T26, T27, T40, T73
T23	T20, T26, T41, T70
T24	T19, T26, T42, T71
T25	T19, T21, T43, T68
T26	T22, T23, T24, T69
T27	T3, T20, T22, T45
T28	T33, T34, T46, T74
T29	T30, T32, T36, T47
T30	T12, T18, T29, T34
T31	T35, T36, T49, T74
T32	T29, T35, T50, T61
T33	T28, T35, T51, T62
T34	T28, T30, T52, T59
T35	T31, T32, T33, T60
T36	T12, T29, T31, T54
T37	T19, T42, T43, T75
T38	T20, T39, T41, T45
T39	T38, T43, T57, T63
T40	T22, T44, T45, T75
T41	T16, T23, T38, T44
T42	T17, T24, T37, T44
T43	T14, T25, T37, T39
T44	T15, T40, T41, T42
T45	T27, T38, T40, T57
T46	T28, T51, T52, T76
T47	T29, T48, T50, T54

T48	T47, T52, T66, T72
T49	T31, T53, T54, T76
T50	T7, T32, T47, T53
T51	T8, T33, T46, T53
T52	T5, T34, T46, T48
T53	T6, T49, T50, T51
T54	T36, T47, T49, T66
T55	T1, T60, T61, T75
T56	T2, T57, T59, T63
T57	T39, T45, T56, T61
T58	T4, T62, T63, T75
T59	T5, T34, T56, T62
T60	T6, T35, T55, T62
T61	T7, T32, T55, T57
T62	T33, T58, T59, T60
T63	T9, T39, T56, T58
T64	T10, T69, T70, T76
T65	T11, T66, T68, T72
T66	T48, T54, T65, T70
T67	T13, T71, T72, T76
T68	T14, T25, T65, T71
T69	T15, T26, T64, T71
T70	T16, T23, T64, T66
T71	T24, T67, T68, T69
T72	T18, T48, T65, T67
T73	T1, T4, T19, T22
T74	T10, T13, T28, T31
T75	T37, T40, T55, T58
T76	T46, T49, T64, T67.

2. The method of claim 1, wherein the zeolite ITQ-55 has, in calcined state and in absence of defects in its crystalline matrix manifested by the presence of silanols, an empiric formula

$$x\,(M_{1/n}XO_2)\colon y\,YO_2\colon g\,GeO_2\colon (1-g)SiO_2$$

in which

M is selected between H^+, at least one inorganic cation of charge +n, and a mixture of both,

X is at least one chemical element of oxidation state +3,

Y is at least one chemical element with oxidation state +4 different from Si,

x takes a value between 0 and 0.2, both included,

y takes a value between 0 and 0.1, both included,

g takes a value between 0 and 0.5, both included.

3. The method of claim 2, wherein x takes a value of essentially zero, y takes a value of essentially zero, and g takes a value of essentially zero.

4. The method of claim 2, wherein a) x takes a value of greater than zero, b) y takes a value of greater than zero, c) g takes a value of greater than zero, or d) a combination thereof.

5. The method of claim 1, wherein forming an adsorbed product fluid stream comprises modifying at least one of a temperature or a pressure of the adsorbent.

6. The method of claim 1, wherein forming an adsorbed product fluid stream comprises exposing a fluid stream comprising a third component to the adsorbent comprising zeolite ITQ-55, at least a portion of the third component being adsorbed by the adsorbent comprising zeolite ITQ-55.

7. The method of claim 1, wherein exposing the input fluid stream to an adsorbent comprises exposing the input fluid stream to an adsorbent in a swing adsorption vessel.

8. The method of claim 7, wherein exposing the input fluid stream to an adsorbent comprises exposing the input fluid stream to the adsorbent under pressure swing adsorption conditions, temperature swing adsorption conditions, rapid cycle pressure swing adsorption conditions, or a combination thereof.

9. The method of claim 7, wherein the input fluid stream comprises natural gas.

10. The method of claim 9, wherein the input fluid stream is exposed to the adsorbent comprising zeolite ITQ-55 at a pressure of about 5 psia (about 0.03 MPa) to about 5000 psia (about 35 MPa), optionally at least about 250 psia (about 1.7 MPa), or at least about 500 psia (about 3.4 MPa), or at least about 1000 psia (about 6.9 MPa).

11. The method of claim 9, wherein the input fluid stream is exposed to the adsorbent at a temperature of about -18°C to about 399°C, or about 316°C or less, or about 260°C or less.

12. The method of claim 9, wherein the first fluid component is N_2, H_2O, CO_2, or a combination thereof.

13. The method of claim 9, wherein the first fluid component is at least one of N_2 and H_2O.

14. The method of claim 9, wherein the first fluid component is N_2.

15. The method of claim 9, wherein the second fluid component is CH_4, a hydrocarbon having a higher molecular weight than CH_4, or a combination thereof.

16. The method of claim 1, wherein the input fluid stream is exposed to the adsorbent at effective conditions for performing a kinetic separation of the first component from the second component.

17. The method of claim 1, wherein the input fluid stream is exposed to the adsorbent at effective conditions for performing an equilibrium separation of the first component from the second component.

18. The method of claim 1, wherein the adsorbent has less than about 20% of open pore volume in pores having diameters greater than about 20 Angstroms and less than

about 1 micron.

19. The method of claim 1, wherein the second fluid component is methane, ethane, methanol, dimethyl ether, an organic compound containing 3 or more heavy atoms, or a combination thereof.

20. The method of claim 19, wherein the first fluid component is CO, CO_2, H_2, H_2O, or a combination thereof.

21. The method of claim 20, wherein the first fluid component is CO_2 and the second fluid component is CH_4.

22. The method of claim 21, wherein the input fluid stream comprises natural gas.

23. The method of claim 19, wherein the first fluid component is ethylene, acetylene, formaldehyde, or a combination thereof.

24. The method of claim 19, wherein the first fluid component is H_2S, NH_3, or a combination thereof.

25. The method of claim 19, wherein the first fluid component is SO_2, N_2O, NO, NO_2, a sulfur oxide, or a combination thereof.

26. The method of claim 19, wherein the first fluid component is N_2.

27. The method of claim 26, wherein the input fluid stream is exposed to the adsorbent at a temperature of about 223 K to about 523 K.

28. The method of claim 19, wherein the first fluid component is a noble gas, a molecular halogen, a halogen hydride, or a combination thereof.

29. The method of claim 1, wherein the first fluid component is methane, ethylene, ethane, methanol, dimethyl ether, or a combination thereof.

30. The method of claim 1, wherein the second fluid component is nitrogen, the first fluid component being hydrogen, a noble gas, oxygen, a nitrogen oxide, CO_2, CO, a molecular halogen, a halogen hydride, or a combination thereof.

31. The method of claim 30, wherein the first fluid component is CO_2.

32. The method of claim 31, wherein the input fluid stream comprises a flue gas.

33. The method of claim 30, wherein the first fluid component is O_2.

34. The method of claim 33, wherein the input fluid stream comprises air.

35. The method of claim 30, wherein the molecular halogen or the halogen halide comprise F, Cl, Br, or a combination thereof as the halogen.

36. The method of claim 1, wherein the first fluid component is CO_2 and the second fluid component comprises one or more hydrocarbons.

37. The method of claim 36, wherein the one or more hydrocarbons are methane, ethane, ethylene, or a combination thereof.

38. The method of claim 1, wherein the first fluid component is ethylene and the second fluid component is ethane, methane, or a combination thereof.

39. The method of claim 1, wherein the first fluid component is a nitrogen oxide and the second fluid component is a sulfur oxide.

40. The method of claim 1, wherein the first fluid component is H_2 and the second fluid component is a nitrogen oxide, a sulfur oxide, a hydrocarbon, a carbon oxide, or a combination thereof.

41. The method of claim 1, wherein the first fluid component is H_2 and the second fluid component is H_2S, NH_3, or a combination thereof.

42. The method of claim 1, wherein the first fluid component is H_2O and the second fluid component is H_2.

43. The method of claim 1, wherein the first fluid component is He, Ne, Ar, Kr, or a combination thereof and the second fluid component is N_2, H_2O, CO, CO_2, a hydrocarbon, or a combination thereof.

44. The method of claim 1, wherein the first fluid component is methanol, dimethyl ether, or a combination thereof.

45. The method of claim 1, wherein the second fluid component is methanol, dimethyl ether, or a combination thereof.

46. The method of claim 1, wherein the first fluid component is acetylene and the second fluid component is ethylene, methane, ethane, or a combination thereof.

47. A method for separating fluids, comprising:

exposing an input fluid stream comprising a first fluid component and a second fluid component to an adsorbent comprising zeolite ITQ-55 to form a rejection product fluid stream, a molar ratio of the first fluid component to the second fluid component in the rejection product fluid stream being less than a molar ratio of the first fluid component to the second fluid component in the input fluid stream;

collecting the rejection product fluid stream;

forming an adsorbed product fluid stream, a molar ratio of the first fluid component to the second fluid component in the adsorbed product stream being greater than the molar ratio of the first fluid component to the second fluid component in the input fluid stream; and

collecting the adsorbed product stream,

wherein the zeolite ITQ-55, as synthesized, has an X-ray diffraction pattern with, at least, the angle values 2θ (degrees) and relative intensities (I/I_0):

2θ (degrees) ±0.5	Intensity (I/I_0)
5.8	w
7.7	w

8.9	w
9.3	mf
9.9	w
10.1	w
13.2	m
13.4	w
14.7	w
15.1	m
15.4	w
15.5	w
17.4	m
17.7	m
19.9	m
20.6	m
21.2	f
21.6	f
22.0	f
23.1	mf
24.4	m
27.0	m

where I_0 is the intensity from the most intense pick to which is assigned a value of 100

w is a weak relative intensity between 0 and 20%,

m is an average relative intensity between 20 and 40%,

f is a strong relative intensity between 40 and 60%,

and mf is a very strong relative intensity between 60 and 100%.