CLAIMS:

1. A synthetic crystalline material having a framework of tetrahedral atoms (T) connected by bridging atoms, the tetrahedral atom framework being defined by connecting the nearest tetrahedral (T) atoms in the manner shown in the following **Table 1** ~~of the specification.~~:

T Atom	Connect to:
T1	T7, T8, T28, T69
T2	T10, T27, T66, T68
T3	T10, T18, T48, T67
T4	T9, T13, T43, T47
T5	T16, T21, T25
T6	T11, T12, T37, T67
T7	T1, T36, T66, T70
T8	T1, T18, T43, T65
T9	T4, T13, T42, T52
T10	T2, T3, T33, T65
T11	T6, T32, T68, T70
T12	T6, T18, T52, T69
T13	T4, T9, T48, T51
T14	T20, T21, T41, T75
T15	T23, T40, T72, T74
T16	T5, T23, T35, T73
T17	T22, T26, T30, T34
T18	T3, T8, T12
T19	T24, T25, T50, T73
T20	T14, T49, T72, T76
T21	T5, T14, T30, T71
T22	T17, T26, T29, T39
T23	T15, T16, T46, T71
T24	T19, T45, T74, T76
T25	T5, T19, T39, T75
T26	T17, T22, T35, T38
T27	T2, T33, T34, T57
T28	T1, T36, T54, T56
T29	T22, T36, T44, T55
T30	T17, T21, T35, T39
T31	T42, T47, T51
T32	T11, T37, T38, T55
T33	T10, T27, T54, T58
T34	T17, T27, T44, T53
T35	T16, T26, T30, T39
T36	T7, T28, T29, T53
T37	T6, T32, T56, T58
T38	T26, T32, T44, T57
T39	T22, T25, T30, T35
T40	T15, T46, T47, T63
T41	T14, T49, T60, T62

T42	T9, T31, T49, T61
T43	T4, T8, T48, T52
T44	T29, T34, T38
T45	T24, T50, T51, T61
T46	T23, T40, T60, T64
T47	T4, T31, T40, T59
T48	T3, T13, T43, T52
T49	T20, T41, T42, T59
T50	T19, T45, T62, T64
T51	T13, T31, T45, T63
T52	T9, T12, T43, T48
T53	T34, T36, T56, T66
T54	T28, T33, T57, T65
T55	T29, T32, T58, T70
T56	T28, T37, T53, T69
T57	T27, T38, T54, T68
T58	T33, T37, T55, T67
T59	T47, T49, T62, T72
T60	T41, T46, T63, T71
T61	T42, T45, T64, T76
T62	T41, T50, T59, T75
T63	T40, T51, T60, T74
T64	T46, T50, T61, T73
T65	T8, T10, T54, T68
T66	T2, T7, T53, T69
T67	T3, T6, T58, T70
T68	T2, T11, T57, T65
T69	T1, T12, T56, T66
T70	T7, T11, T55, T67
T71	T21, T23, T60, T74
T72	T15, T20, T59, T75
T73	T16, T19, T64, T76
T74	T15, T24, T63, T71
T75	T14, T25, T62, T72
T76	T20, T24, T61, T73

2. The crystalline material of claim 1 wherein said tetrahedral atoms include one or more elements selected from the group consisting of Li, Be, B, Mg, Al, Si, P, Ti, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Ga, Ge, As, In, Sn, Sb.

3. The crystalline material of claim 1 wherein said bridging atoms include one or more elements selected from the group consisting of O, N, F, S, Se, and C.

4. A synthetic porous crystalline material, as synthesized, characterized by an X-ray diffraction pattern including the peaks as substantially set forth in the following Table 4 ~~of the specification.~~:

d (Å)	Relative intensity (%)
16.6-15.7	30-80
14.6-13.9	60-100
13.3-12.7	30-80
7.40-7.22	5-40
7.09-6.93	5-40
6.58-6.43	5-40
5.42-5.32	5-40
4.002-3.949	5-40
3.970-3.918	5-40
3.492-3.452	5-50
3.119-3.087	5-40
3.063-3.032	5-40

5. The crystalline material of ~~Claim~~ claim 4 wherein said crystalline material as synthesized has a composition of $aR:YO_2:bX_2O_3:cF:dH_2O$, wherein a ranges from about 0.01 to about 0.5; R is an organic structure directing agent; b ranges from 0 to about 0.2; Y is Si alone or in combination with any other tetravalent metal capable of tetrahedral coordination; and X is any metal capable of tetrahedral coordination; c ranges from about 0.01 to about 0.5; F is a source of fluoride; and, d ranges from 0 to about 1.

~~6. A calcined dehydrated material characterized by an X-ray diffraction pattern including the most significant lines substantially, as set forth in Table 5 of the specification.~~

~~7. The calcined dehydrated material of Claim 6 wherein said crystalline material has a composition $YO_2:bX_2O_3$, wherein where b ranges from 0 to about 0.2; Y is Si alone or in combination with any other tetravalent metal capable of tetrahedral coordination; and, X is any metal capable of tetrahedral coordination.~~

~~8.~~6. The crystalline material of ~~Claims~~ claim 5 ~~or 7~~ wherein X is one or more of Li, Be, B, Mg, Al, P, Cr, Mn, Fe, Cu, Co, Ni, Cu, Zn, Ga, As, In, Sn, Sb.

~~9.~~7. The crystalline material of ~~Claims~~ claim 5 ~~or 7~~ wherein Y is Si alone or in combination with any other tetravalent metal capable of tetrahedral coordination ~~such as Ti, Zr, or Ge~~.

8. A calcined dehydrated material characterized by an X-ray diffraction pattern including the most significant lines substantially, as set forth in the following Table 5:

d (Å)	Relative intensity (%)
16.5-15.6	60-100
14.6-13.9	60-100
13.3-12.7	50-90
10.8-10.4	5-40
7.41-7.23	1-20
6.57-6.43	1-20
5.43-5.33	1-20
3.976-3.924	1-20
3.560-3.518	1-20
3.497-3.457	1-20
3.065-3.035	1-20

9. The calcined dehydrated material of claim 8 wherein said crystalline material has a composition YO_2:bX_2O_3, wherein where b ranges from 0 to about 0.2; Y is Si alone or in combination with any other tetravalent metal capable of tetrahedral coordination; and, X is any metal capable of tetrahedral coordination.

~~10. A process for the separation of hydrocarbons from a hydrocarbon-containing stream using any of the materials of claims 1 through claim 7.~~

~~11. A process for converting a feedstock comprising organic compounds to at least one conversion product which comprises contacting said feedstock at organic compound conversion conditions with a catalyst comprising an active form of any of the materials of claims 1 through claim 9.~~

~~12. The process for converting a feedstock as in claim 11 wherein the catalyst is combined with a hydrogenating metal.~~

~~13. The process for converting a feedstock as in claim 12 wherein said hydrogenating metal is one or more metals selected from the group consisting of tungsten, vanadium, molybdenum, rhenium, nickel, cobalt, chromium, manganese, or a noble metal.~~

10. The crystalline material of claim 9 wherein X is one or more of Li, Be, B, Mg, Al, P, Cr, Mn, Fe, Cu, Co, Ni, Cu, Zn, Ga, As, In, Sn, Sb.

11. The crystalline material of claim 9 wherein Y is Si alone or in combination with one or more of Ti, Zr, or Ge.

~~14.~~12. A ~~method of~~ product produced by synthesizing a crystalline silicate composition of ITQ-40 having the diffraction pattern similar to Table 4 by mixing together a source of silica, a source of tetravalent metal, an organic structure directing agent (R), a source of fluoride, water, and optionally a metal (X), with a composition, in terms of mole ratios, within the following ranges:

R/YO_2	0.01 – 1.0
H_2O/ YO_2	0.50 – 50.0
X/ YO_2	0.00 – 0.2
F/YO_2	0.01 – 2.0

and wherein X is any metal capable of tetrahedral coordination and Y is Si alone or in combination with any other tetravalent metal capable of tetrahedral coordination; and, heating the mixture for a time and temperature to crystallize the composition, wherein said organic structure directing agent is diphenyldimethylphosphonium.

~~15.~~13. The ~~method according to~~ product of claim ~~14~~ 12 wherein ~~X is one or more metals selected from the group consisting of B and Al, and~~ Y is Si alone or in

combination with ~~any other tetravalent metal selected from the group consisting~~ one or more of Ti, Zr, ~~and~~ or Ge.

14. The product of claim 13 wherein the composition, in terms of mole ratios, falls within the following ranges:

R/YO_2	0.10 – 0.5
H_2O/ YO_2	1.00 – 5.0
X/ YO_2	0.00 – 0.1
F/YO_2	0.01 – 0.5.

~~16.~~15. A ~~method of~~ product produced by synthesizing a crystalline silicate composition of ITQ-40 having the diffraction pattern similar to Table 4 by mixing together a source of silica, a source of tetravalent metal, an organic structure directing agent (R), a source of fluoride, water, and optionally a metal (X), with a composition, in terms of mole ratios, within the following ranges:

R/YO_2	~~0.10 – 0.5~~ 0.01 - 1.0
H_2O/ YO_2	~~1.00 – 5.0~~ 0.50 - 50.0
X/ YO_2	0.00 – ~~0.1~~ 0.2
F/YO_2	0.01 – ~~0.5~~2.0

and wherein X is ~~one or more metals selected from the group consisting of Li, Be, B, Mg, Al, P, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, As, In, Sn, Sb,~~ any metal capable of tetrahedral coordination and Y is Si alone or in combination with any other tetravalent metal ~~selected from the group consisting of Ti, Zr, and Ge~~ capable of tetrahedral coordination; and heating the mixture for a time and temperature to crystallize the composition, wherein said organic structure directing agent is diphenyldiethylphosphonium.

~~17. A method of synthesizing a crystalline silicate composition of any of the claims 14 through 16 wherein said organic structure directing agent is diphenyldimethylphosphonium.~~

~~18. A method of synthesizing a crystalline silicate composition of any of the claims 14 through 16 wherein said organic structure directing agent is diphenyldiethylphosphonium.~~

~~19. The product produced using the method of claim 17.~~

~~20. The product produced using the method of claim 18.~~

16. The product of claim 15 wherein Y is Si alone or in combination with one or more of Ti, Zr, or Ge.

17. The product of claim 16 wherein the composition, in terms of mole ratios, falls within the following ranges:

R/YO_2	0.10 – 0.5
H_2O/ YO_2	1.00 – 5.0
X/ YO_2	0.00 – 0.1
F/YO_2	0.01 – 0.5.