Claims

1. A molecular sieve having an X-ray diffraction pattern ~~substantially~~ as shown in the following table:

2θ(°)	Relative intensity (I/I_0)×100
6.53±0.3	m-s
7.05±0.3	vs
9.56±0.3	w-m
10.77±0.3	s
12.84±0.3	w-m
18.80±0.3	m-s
22.60±0.3	m-s

preferably, the X-ray diffraction pattern further comprises X-ray diffraction peaks ~~substantially~~ as shown in the following table:

2θ(°)	Relative intensity (I/I_0)×100
7.81±0.3	w
14.37±0.3	w
14.76±0.3	w
15.45±0.3	w
16.35±0.3	w
17.52±0.3	w
19.79±0.3	w

more preferably, said X-ray diffraction pattern optionally further comprises X-ray diffraction peaks ~~substantially~~ as shown in the following table,

2θ(°)	Relative intensity (I/I_0)×100
21.46±0.3	w-m
22.04±0.3	w-m
23.64±0.3	m
24.54±0.3	m
25.14±0.3	m
26.11±0.3~~.~~	w-m.

2. The molecular sieve of claim 1, wherein the molecular sieve is based on silicon and germanium.

3. The molecular sieve according to any of the previous claims, wherein the molecular sieve

has an X-ray diffraction pattern ~~substantially~~ as shown in the following table:

2θ(°)	Interplanar spacing (Å)	Relative intensity (I/I_0)×100
6.53±0.3	13.53±0.40	m-s
7.05±0.3	12.53±0.35	vs
9.56±0.3	9.24±0.30	w-m
10.77±0.3	8.21±0.30	s
12.84±0.3	6.89±0.25	w-m
18.80±0.3	4.72±0.15	m-s
22.60±0.3	3.93±0.10	m-s

preferably, the X-ray diffraction pattern further comprises X-ray diffraction peaks ~~substantially~~ as shown in the following table:

2θ(°)	Interplanar spacing (Å)	Relative intensity (I/I_0)×100
7.81±0.3	11.31±0.35	w
14.37±0.3	6.16±0.25	w
14.76±0.3	6.00±0.25	w
15.45±0.3	5.73±0.20	w
16.35±0.3	5.42±0.20	w
17.52±0.3	5.06±0.15	w
19.79±0.3	4.48±0.15	w

more preferably, said X-ray diffraction pattern optionally further comprises X-ray diffraction peaks ~~substantially~~ as shown in the following table,

2θ(°)	Interplanar spacing (Å)	Relative intensity (I/I_0)×100
21.46±0.3	4.14±0.10	w-m
22.04±0.3	4.03±0.10	w-m
23.64±0.3	3.76±0.10	m
24.54±0.3	3.62±0.05	m
25.14±0.3	3.54±0.05	m
26.11±0.3	3.41±0.05	w-m.

~~4. The molecular sieve according to any of the previous claims, wherein the molecular sieve has an X-ray diffraction pattern substantially as shown in the following table:~~

~~2θ(°)~~
~~6.53±0.15~~
~~7.05±0.15~~

~~9.56±0.15~~
~~10.77±0.15~~
~~12.84±0.15~~
~~18.80±0.15~~
~~22.60±0.15~~

~~preferably, the X-ray diffraction pattern further comprises X-ray diffraction peaks substantially as shown in the following table:~~

~~2θ(°)~~
~~7.81±0.15~~
~~14.37±0.15~~
~~14.76±0.15~~
~~15.45±0.15~~
~~16.35±0.15~~
~~17.52±0.15~~
~~19.79±0.15~~

~~more preferably, said X-ray diffraction pattern optionally further comprises X-ray diffraction peaks substantially as shown in the following table,~~

~~2θ(°)~~
~~21.46±0.15~~
~~22.04±0.15~~
~~23.64±0.15~~
~~24.54±0.15~~
~~25.14±0.15~~
~~26.11±0.15.~~

~~4~~5. The molecular sieve according to any of the previous claims, wherein the molecular sieve has an X-ray diffraction pattern ~~substantially~~ as shown in the following table:

2θ(°)	Relative intensity (I/I_0)×100
6.53±0.15	m or s
7.05±0.15	vs
9.56±0.15	w or m
10.77±0.15	s
12.84±0.15	w or m
18.80±0.15	m or s

22.60±0.15	m or s

preferably, the X-ray diffraction pattern further comprises X-ray diffraction peaks ~~substantially~~ as shown in the following table:

2θ(°)	Relative intensity (I/I_0)×100
7.81±0.15	w
14.37±0.15	w
14.76±0.15	w
15.45±0.15	w
16.35±0.15	w
17.52±0.15	w
19.79±0.15	w

more preferably, said X-ray diffraction pattern optionally further comprises X-ray diffraction peaks ~~substantially~~ as shown in the following table,

2θ(°)	Relative intensity (I/I_0)×100
21.46±0.15	w or m
22.04±0.15	w or m
23.64±0.15	m
24.54±0.15	m
25.14±0.15	m
26.11±0.15	w or m.

~~6. The molecular sieve according to any of the previous claims, wherein the molecular sieve has an X-ray diffraction pattern substantially as shown in the following table:~~

~~2θ(°)~~
~~6.995±0.200~~
~~10.730±0.200~~
~~22.515±0.200~~
~~6.505±0.200~~
~~18.755±0.200~~

~~preferably, the X-ray diffraction pattern further comprises X-ray diffraction peaks substantially as shown in the following table:~~

~~2θ(°)~~
~~23.585±0.200~~
~~24.470±0.200~~

~~25.065±0.200~~
~~21.980±0.200~~
~~7.870±0.200~~
~~9.560±0.200~~

~~more preferably, said X-ray diffraction pattern optionally further comprises X-ray diffraction peaks substantially as shown in the following table,~~

~~2θ(°)~~
~~12.845±0.200~~
~~14.320±0.200~~
~~14.725±0.200~~
~~15.380±0.200~~
~~16.295±0.200~~
~~17.490±0.200~~
~~19.745±0.200~~
~~21.400±0.200~~
~~26.055±0.200.~~

~~7~~5. The molecular sieve according to any of the previous claims, wherein the molecular sieve has an X-ray diffraction pattern ~~substantially~~ as shown in the following table:

2θ(°)	Relative intensity
6.995±0.200	vs
10.730±0.200	s
22.515±0.200	s
6.505±0.200	m or s
18.755±0.200	m or s

preferably, the X-ray diffraction pattern further comprises X-ray diffraction peaks ~~substantially~~ as shown in the following table:

2θ(°)	Relative intensity
23.585±0.200	m
24.470±0.200	m
25.065±0.200	m
21.980±0.200	w or m
7.870±0.200	w
9.560±0.200	w

more preferably, said X-ray diffraction pattern optionally further comprises X-ray diffraction peaks ~~substantially~~ as shown in the following table,

2θ(°)	Relative intensity
12.845±0.200	w
14.320±0.200	w
14.725±0.200	w
15.380±0.200	w
16.295±0.200	w
17.490±0.200	w
19.745±0.200	w
21.400±0.200	w
26.055±0.200	w.

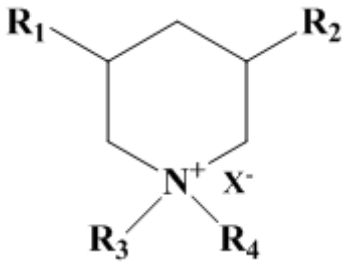
~~8~~6. The molecular sieve according to any of the previous claims, wherein the calcined form of the molecular sieve has a framework chemical composition as represented by the formula "SiO_2•1/nGeO_2", wherein the silicon/germanium molar ratio is 0.1≤n≤30, preferably 0.25≤n≤20, more preferably 0.5≤n≤15, more preferably 1≤n≤5.

~~9~~7. The molecular sieve according to any of the previous claims, wherein the molecular sieve in form of the synthesis state has a framework chemical composition as represented by the formula "kF•mQ•SiO_2•1/nGeO_2•pH_2O ", wherein

the silicon/germanium molar ratio is 0.1≤n≤30, preferably 0.25≤n≤20, more preferably 0.5≤n≤15, more preferably 1≤n≤5;

0.05≤k≤1.0, preferably 0.05≤k≤0.5, more preferably 0.1≤k≤0.5, more preferably 0.1≤k≤0.4;

Q is an organic template agent, 0.01≤m≤1.0, preferably 0.02≤m≤0.5, more preferably 0.05≤m≤0.5, more preferably 0.05≤m≤0.3; said organic template agent is selected from quaternary ammonium forms containing 1,1,3,5-tetraalkyl piperidinium ion or represented by the following structural formula, preferably 1,1,3,5-tetramethyl piperidinium hydroxide;



In the above formula, R_1-R_4 each independently are H or C_{1-4} alkyl, preferably C_{1-2}

alkyl, more preferably -CH_3, X^- is a halide ion (for example Cl^-, Br^- and I^-) and a hydroxyl ion (OH^-), preferably a hydroxyl ion (OH^-);

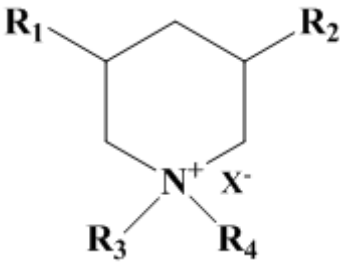
$0.005 \leq p \leq 0.5$, preferably $0.01 \leq p \leq 0.4$, more preferably $0.01 \leq p \leq 0.3$, more preferably $0.02 \leq p \leq 0.2$.

~~10~~8. The molecular sieve according to any of the previous claims, wherein no more than 10% of Ge atoms in the molecular sieve are substituted with atoms of at least one element other than silicon and germanium.

~~11~~9. The molecular sieve according to any of the previous claims, wherein said element(s) rather than silicon and germanium is at least one selected from a group consisting of boron, aluminum, gallium, titanium, zirconium, hafnium, tin, zinc, iron, chromium and indium, preferably at least one selected from a group consisting of aluminum and titanium.

~~12~~10. A process for preparing the molecular sieve according to any of claims 1-9, which comprises a step of crystallizing a mixture containing a silicon source, a germanium source, a fluorine source, an organic template agent Q and water or formed from a silicon source, a germanium source, a fluorine source, an organic template agent Q and water to obtain the molecular sieve; and optionally, a step of calcining said obtained molecular sieve;

wherein said organic template agent Q is selected from a quaternary ammonium form containing 1,1,3,5-tetraalkyl piperidinium ion or represented by the following structural formula, preferably 1,1,3,5-tetramethyl piperidinium hydroxide;



wherein R_1-R_4 each independently are H or C_{1-4} alkyl, preferably C_{1-2} alkyl, more preferably -CH_3, X^- is a halide ion (for example Cl^-, Br^- and I^-) and a hydroxyl ion (OH^-), preferably a hydroxyl ion (OH^-).

~~13~~11. The ~~synthesis~~ process ~~of the molecular sieve~~ according to claim ~~12~~10, which is characterized in that said silicon source is at least one selected from a group consisting of water glass, silica sol, solid silica gel, fumed silica, amorphous silica, diatomite, zeolite, and tetraethyl orthosilicate; said germanium source is at least one selected from a group consisting of germanium oxide, germanium nitrate and germanium tetraalkoxide, wherein the alkyloxy is C_1-C_6 alkyloxy;

The molar ratio of said organic template agent Q, said silicon source (as SiO_2), said germanium source (as GeO_2), said fluorine source (as F) and water is $Q:SiO_2:GeO_2:F:H_2O$ =0.15-

4:1:0.033-10:0.2-4:0.5-50, preferably $Q:SiO_2:GeO_2:F:H_2O$ =0.25-3.5:1:0.05-4:0.35-3.5:1-35, more preferably $Q:SiO_2:GeO_2:F:H_2O$ =0.3-2.5:1:0.067-2:0.4-2.5:1.5-25, more preferably $Q:SiO_2:GeO_2:F:H_2O$ =0.35-1.5:1:0.2-1:0.45-2:2-15.

~~14~~12. The ~~synthesis~~ process ~~of the molecular sieve~~ according to claim ~~12~~10, which is characterized in that said fluorine source comprises at least one selected from a group consisting of hydrofluoric acid, ammonium fluoride, sodium fluoride, and potassium fluoride, preferably at least one selected from a group consisting of hydrofluoric acid and ammonium fluoride.

~~15~~13. The ~~synthesis~~ process ~~of the molecular sieve~~ according to claim ~~12~~10, which is characterized in that said crystallization condition comprises crystallizing at 100-200°C for 30-400 hours; preferably crystallizing at 110-190°C for 48-360 hours; more preferably crystallizing at 120-180°C for 72-320 hours.

~~16~~14. The ~~synthesis~~ process ~~of the molecular sieve~~ according to claim ~~12~~10, which is characterized in that said mixture further comprises a source containing the element(s) rather than silicon and germanium, preferably at least one selected from a group consisting of boron source, aluminium source, gallium source, titanium source, zirconium source, hafnium source, tin source, zinc source, iron source, chromium source and indium source; more preferably at least one oxide source selected from a group consisting of boron oxide source, alumina source, gallium oxide source, titania source, zirconia source, hafnia source, tin oxide source, zinc oxide source, iron oxide source, chromic oxide source and indium oxide source;

the molar ratio of said oxide source (as the corresponding oxide) to said germanium source (as GeO_2) is (0.01-0.1):1, preferably (0.015-0.08):1.

~~17~~15. A molecular sieve composition, containing the molecular sieve according to any of claims 1-~~11~~ 9 or a molecular sieve prepared with the ~~synthesis~~ process ~~of the molecular sieve~~ according to any of claims ~~12~~10-~~16~~14, and a binder.

~~18~~16. Use of the molecular sieve according to any of claims 1-~~11~~9, a molecular sieve prepared with the ~~synthesis~~ process ~~of the molecular sieve~~ according to any of claims ~~12~~10-~~16~~14, or the molecular sieve composition according to claim ~~17~~ 15 as adsorbent or catalyst.