CLAIMS

1. A catalyst composition comprising:

from 10 wt.% to 50 wt.% of matrix material;

from 10 wt.% to 30 wt.% of binder; and

from 45 wt.% to 70 wt.% of a zeolite mixture, wherein:

the zeolite mixture comprises all zeolite in the catalyst composition;

the zeolite mixture comprises at least a first portion of zeolite and a second portion of zeolite;

the first portion of zeolite consists of zeolite having a silica to alumina molar ratio in a first range and comprises at least 10 wt.% of the zeolite mixture;

the second portion of zeolite consists of zeolite having a silica to alumina molar ratio in a second range and comprises at least 10 wt.% of the zeolite mixture;

the silica to alumina molar ratio range of the first portion of zeolite and the silica to alumina molar ratio range of the second portion of zeolite do not overlap and are separated by at least 5;

the midpoint of the silica to alumina molar ratio range of the second portion of zeolite less the midpoint of the silica to alumina molar ratio range of the first portion of zeolite equals at least 15; and

wherein at least one of:

the first portion of zeolite comprises ZSM-5, and the second portion of zeolite comprises ZSM-5; or

the first portion of zeolite comprises Zeolite Y, and the second portion of zeolite comprises Zeolite Y.

2. A catalyst composition comprising:

from 10 wt.% to 50 wt.% of matrix material;

from 10 wt.% to 30 wt.% of binder;

from 1 wt.% to 40 wt.% of silicon carbide particles; and

from 30 wt.% to 70 wt.% of a zeolite mixture, wherein:

the zeolite mixture comprises all zeolite in the catalyst composition;

the zeolite mixture comprises at least a first portion of zeolite and a second portion of zeolite;

the first portion of zeolite consists of zeolite having a silica to alumina molar ratio in a first range and comprises at least 10 wt.% of the zeolite mixture;

the second portion of zeolite consists of zeolite having a silica to alumina molar ratio in a second range and comprises at least 10 wt.% of the zeolite mixture;

the silica to alumina molar ratio range of the first portion of zeolite and the silica to alumina molar ratio range of the second portion of zeolite do not overlap and are separated by at least 5;

the midpoint of the silica to alumina molar ratio range of the second portion of zeolite less the midpoint of the silica to alumina molar ratio range of the first portion of zeolite equals at least 15.

3. The catalyst composition of claim 1 or claim 2, wherein:

the silica to alumina molar ratio of the first portion of zeolite is from 25 to 35; and

the silica to alumina molar ratio of the second portion of zeolite is from 250 to 300.

4. A catalyst composition comprising:

from 10 wt.% to 50 wt.% of matrix material; and

from 10 wt.% to 30 wt.% of binder;

from 30 wt.% to 70 wt.% of a zeolite mixture, wherein:

the zeolite mixture comprises all zeolite in the catalyst composition;

the zeolite mixture comprises at least a first portion of zeolite and a second portion of zeolite;

the first portion of zeolite consists of zeolite having a silica to alumina molar ratio in a first range and comprises at least 10 wt.% of the zeolite mixture;

the second portion of zeolite consists of zeolite having a silica to alumina molar ratio in a second range and comprises at least 10 wt.% of the zeolite mixture;

the silica to alumina molar ratio range of the first portion of zeolite and the silica to alumina molar ratio range of the second portion of zeolite do not overlap and are separated by at least 5;

the midpoint of the silica to alumina molar ratio range of the second portion of zeolite less the midpoint of the silica to alumina molar ratio range of the first portion of zeolite equals at least 15;

the zeolite mixture further comprises a third portion of zeolite, wherein:

the third portion of zeolite consists of zeolite having a silica to alumina molar ratio in a third range;

the silica to alumina molar ratio range of the third portion of zeolite and the silica to alumina molar ratio range of the second portion of zeolite do not overlap; and

the midpoint of the silica to alumina molar ratio range of the third portion of zeolite less the midpoint of the silica to alumina molar ratio range of the second portion of zeolite equals at least 15.

5. The catalyst composition of claim 4, wherein:

the silica to alumina molar ratio of the first portion of zeolite is from 25 to 35;

the silica to alumina molar ratio of the second portion of zeolite is from 40 to 60; and

the silica to alumina molar ratio of the third portion of zeolite is from 70 to 90.

6. The catalyst composition of claim 4, wherein:

the silica to alumina molar ratio of the first portion of zeolite is from 40 to 60;

the silica to alumina molar ratio of the second portion of zeolite is from 70 to 90; and

the silica to alumina molar ratio of the third portion of zeolite is from 250 to 300.

7. The catalyst composition of claim 4, wherein:

the silica to alumina molar ratio of the first portion of zeolite is from 25 to 35;

the silica to alumina molar ratio of the second portion of zeolite is from 70 to 90; and

the silica to alumina molar ratio of the third portion of zeolite is from 250 to 300.

8. The catalyst composition of any one of claims 4 to 7, wherein the zeolite mixture further comprises a fourth portion of zeolite, wherein:

the fourth portion of zeolite consists of zeolite having a silica to alumina molar ratio in a fourth range;

the silica to alumina molar ratio range of the fourth portion of zeolite and the silica to alumina molar ratio range of the third portion of zeolite do not overlap; and

the midpoint of the silica to alumina molar ratio range of the fourth portion of zeolite less the midpoint of the silica to alumina molar ratio range of the third portion of zeolite equals at least 15.

9. The catalyst composition of any one of claims 1 to 8, wherein:

the zeolite mixture comprises ZSM-5 zeolite;

the zeolite mixture comprises zeolite Y; or

the zeolite mixture comprises ZSM-5 zeolite and zeolite Y.

10. The catalyst composition of any one of claims 1 to 9, wherein the catalyst composition is formed as particles.

11. The catalyst composition of claim 10, wherein the first and second portions of zeolite are each present on the same particles.

12. The catalyst composition of claim 10, wherein the first and second portions of zeolite are each present on separate particles.

13. The catalyst composition of any one of claims 1 to 12, wherein one or more of:

the matrix material is kaolin;

the binder is silica, alumina, or combinations thereof;

the first portion of zeolite comprises ZSM-5, and the second portion of zeolite comprises ZSM-5; and

the first portion of zeolite comprises Zeolite Y, and the second portion of zeolite comprises Zeolite Y.

14. The catalyst composition of any one of claims 1 to 13, consisting essentially of:

from 10 wt.% to 50 wt.% of the matrix material;

from 10 wt.% to 30 wt.% of the binder; and

from 45 wt.% to 70 wt.% of the zeolite mixture, wherein

each of the first portion of zeolite and the second portion of zeolite comprise at least 20 wt.% of the zeolite mixture.

15. A method for processing hydrocarbons, the method comprising:

passing a hydrocarbon feedstock to a reactor;

contacting the hydrocarbon feedstock with the catalyst composition of any one of claims 1 to 14 to produce a product stream; and

passing the product stream out of the reactor.