What is claimed is:

1. An ~~environmental barrier coating composition for a ceramic matrix composite~~article comprising:

a ceramic matrix composite;

a doped rare earth disilicate layer located over the ceramic matrix composite;

~~wherein the doped rare earth disilicate layer is located over the ceramic matrix composite;~~

wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is at least one element selected from the group consisting of ~~at least one of~~ lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the doped rare earth disilicate layer further includes a dopant that is Al_2O_3 and alkali oxide; and

wherein the dopant is present in the doped rare earth disilicate layer in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer ~~being~~ is the disilicate.

2. The ~~environmental barrier coating composition~~article of ~~Claim~~ claim 1, wherein the dopant is present in the doped rare earth disilicate layer in an amount between about 0.5 wt% and about 3 wt%.

3. The ~~environmental barrier coating composition~~article of ~~Claim~~ claim 1, wherein the dopant is present in the doped rare earth disilicate layer in an amount between about 0.5 wt% and about 1 wt%.

4. The ~~environmental barrier coating composition~~article of ~~Claim~~ claim 1, further comprising an uppermost top coat selected from the group consisting of a rare

earth disilicate layer, a rare earth monosilicate layer, a dual-layered coat including a rare earth monosilicate layer over a rare earth disilicate layer, and a rare earth disilicate and rare earth monosilicate layer; wherein the rare earth disilicate has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium; and the rare earth monosilicate has a composition of RE_2SiO_5, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium.

5. The ~~environmental barrier coating composition~~article of ~~Claim~~ claim 1, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

6. The ~~environmental barrier coating composition~~article of ~~Claim~~ claim 1, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.

7. ~~An environmental barrier coating composition for a ceramic matrix composite~~The article of any one of claims 1 to 6, further comprising:

~~a doped rare earth disilicate layer;~~

a silicon coat layer;

~~wherein the doped rare earth disilicate layer is located over the silicon coat layer;~~

wherein the silicon coat layer is ~~located~~ between the doped rare earth disilicate layer and the ceramic matrix composite~~;~~.

~~wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium,~~

europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 and alkali oxide; and

wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate.

8. The environmental barrier coating composition of Claim 7, wherein the dopant is present in an amount between about 0.5 wt% and about 3 wt%.

9. The environmental barrier coating composition of Claim 7, wherein the dopant is present in an amount between about 0.5 wt% and about 1 wt%.

10. The environmental barrier coating composition of Claim 7, further comprising an uppermost top coat selected from the group consisting of a rare earth disilicate layer, a rare earth monosilicate layer, a dual-layered coat including a rare earth monosilicate layer over a rare earth disilicate layer, and a rare earth disilicate and rare earth monosilicate layer; wherein the rare earth disilicate has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium; and the monosilicate has a composition of RE_2SiO_5, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium.

11. The environmental barrier coating composition of Claim 7, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

12. The environmental barrier coating composition of Claim 7, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.

~~138~~. ~~An environmental barrier coating composition for a ceramic matrix composite~~The article of any one of claims 1 to 5, further comprising:

a calcium-magnesium aluminosilicate-resistant layer;

~~a doped rare earth disilicate layer;~~

wherein the calcium-magnesium aluminosilicate-resistant layer is ~~located~~ over the doped rare earth disilicate layer;

~~wherein the doped rare earth disilicate layer is located between the calcium-magnesium aluminosilicate-resistant layer and the ceramic matrix composite;~~

~~wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;~~

~~wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 and alkali oxide; and~~

~~wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate;~~

wherein the calcium-magnesium aluminosilicate-resistant layer comprises a rare earth oxide, an alkali oxide, alumina, and silica, wherein the rare earth oxide has a composition of RE_2O_3, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

~~wherein the calcium-magnesium aluminosilicate-resistant layer includes an alkali oxide, Al_2O_3, and SiO_2;~~

wherein the ~~Al_2O_3~~ alumina in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 5 wt%;

wherein the alkali oxide in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 1 wt%; and

wherein the ~~SiO_2~~ silica in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 25 wt% with the balance being the rare earth oxide.

~~14~~9. The ~~environmental barrier coating composition~~article of Claim ~~13~~8, wherein the calcium-magnesium aluminosilicate-resistant layer further comprises an oxide selected from the group consisting of at least one of Ta_2O_5, TiO_2, and $HfSiO_4$.

~~15~~10. The ~~environmental barrier coating composition~~article of ~~Claim 13~~claim 8, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 3 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 20 wt%.

~~16~~11. The ~~environmental barrier coating composition~~article of ~~Claim 13~~claim 8, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 10 wt% and about 20 wt%.

~~17~~12. The ~~environmental barrier coating composition~~article of ~~Claim 14~~claim 9, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 3 wt%.

~~18. The environmental barrier coating composition of Claim 14, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt%.~~

~~19. The environmental barrier coating composition of Claim 13, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 0.5 mils to about 10 mils.~~

~~20. The environmental barrier coating composition of Claim 13, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 1 mil to about 3 mils.~~

~~21. The environmental barrier coating composition of Claim 13, wherein the dopant in the doped rare earth disilicate layer is the Al_2O_3 which is present in an amount between about 0.5 wt% and about 3 wt%.~~

~~22. The environmental barrier coating composition of Claim 13, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 1 wt%.~~

~~23. The environmental barrier coating composition of Claim 13, wherein the alkali oxide in the doped rare earth disilicate layer is present in an amount between about 0.1 wt% and about 1 wt%.~~

~~24. The environmental barrier coating composition of Claim 13, further comprising an uppermost top coat selected from the group consisting of a rare earth disilicate layer, a rare earth monosilicate layer, a dual-layered coat including a rare earth monosilicate layer over a rare earth disilicate layer, and a rare earth disilicate and rare earth monosilicate layer; wherein the rare earth disilicate has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium; and the monosilicate has a composition of RE_2SiO_5, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium.~~

~~25. The environmental barrier coating composition of Claim 13, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.~~

~~26. The environmental barrier coating composition of Claim 13, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.~~

~~27~~13. ~~An environmental barrier coating composition for a ceramic matrix composite~~The article of any one of claims 1 to 12, further comprising:

a barium-strontium-aluminosilicate layer;

~~a doped rare earth disilicate layer;~~

wherein the barium-strontium-aluminosilicate layer is ~~located~~ over the doped rare earth disilicate layer;

~~wherein the doped rare earth disilicate layer is located between the barium-strontium-aluminosilicate layer and the ceramic matrix composite;~~

~~wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;~~

~~wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 and alkali oxide; and~~

~~wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate.~~

14. The article of claim 13 in combination with any one of claims 8 to 12, wherein the barium-strontium-aluminosilicate layer is between the calcium-magnesium aluminosilicate-resistant layer and the doped rare earth disilicate layer.

15. The article of claim 13 in combination with any one of claims 8 to 12, wherein the calcium-magnesium aluminosilicate-resistant layer is between the barium-strontium-aluminosilicate layer and the doped rare earth disilicate layer.

~~28. The environmental barrier coating composition of Claim 27, wherein the dopant is present in an amount between about 0.5 wt% and about 3 wt%.~~

29. The environmental barrier coating composition of Claim 27, wherein the dopant is present in an amount between about 0.5 wt% and about 1 wt%.

30. The environmental barrier coating composition of Claim 27, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

31. The environmental barrier coating composition of Claim 27, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.

32. An environmental barrier coating composition for a ceramic matrix composite comprising:

a barium-strontium-aluminosilicate layer;

a doped rare earth disilicate layer;

a silicon coat layer;

wherein the barium-strontium-aluminosilicate layer is located over the doped rare earth disilicate layer;

wherein the doped rare earth disilicate layer is located between the barium-strontium-aluminosilicate layer and the silicon coat layer;

wherein the silicon coat layer is located between the doped rare earth disilicate layer and the ceramic matrix composite;

wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 and alkali oxide; and

wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate.

33. The environmental barrier coating composition of Claim 32, wherein the Al_2O_3 is present in an amount between about 0.5 wt% and about 3 wt%.

34. The environmental barrier coating composition of Claim 32, wherein the Al_2O_3 is present in an amount between about 0.5 wt% and about 1 wt%.

35. The environmental barrier coating composition of Claim 32, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

36. The environmental barrier coating composition of Claim 32, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.

37. An environmental barrier coating composition for a ceramic matrix composite comprising:

a barium-strontium-aluminosilicate layer;

a calcium-magnesium aluminosilicate-resistant layer;

a doped rare earth disilicate layer;

wherein the barium-strontium-aluminosilicate layer is located over the calcium-magnesium aluminosilicate-resistant layer;

wherein the calcium-magnesium aluminosilicate-resistant layer is located between the barium-strontium-aluminosilicate layer and the doped rare earth disilicate layer;

wherein the doped rare earth disilicate layer is located between the calcium-magnesium aluminosilicate-resistant layer and the ceramic matrix composite;

wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 an alkali oxide;

wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate;

wherein the calcium-magnesium aluminosilicate-resistant layer comprises a rare earth oxide, alumina, and silica wherein the rare earth oxide has a composition of RE_2O_3, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the calcium-magnesium aluminosilicate-resistant layer includes an alkali oxide, Al_2O_3 and SiO_2;

wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 5 wt%;

wherein the alkali oxide in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 1 wt%; and

wherein the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 25 wt% with the balance being the rare earth oxide.

38. The environmental barrier coating composition of Claim 37, wherein the calcium-magnesium aluminosilicate-resistant layer further comprises an oxide selected from the group consisting of at least one of Ta_2O_5, TiO_2, and $HfSiO_4$.

39. The environmental barrier coating composition of Claim 37, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 3 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 20 wt%.

40. The environmental barrier coating composition of Claim 37, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 10 wt% and about 20 wt%.

41. The environmental barrier coating composition of Claim 38, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 3 wt%.

42. The environmental barrier coating composition of Claim 38, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt%.

43. The environmental barrier coating composition of Claim 37, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 0.5 mils to about 10 mils.

44. The environmental barrier coating composition of Claim 37, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 1 mil to about 3 mils.

45. The environmental barrier coating composition of Claim 37, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 3 wt%.

46. The environmental barrier coating composition of Claim 37, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 1 wt%.

47. The environmental barrier coating composition of Claim 37, wherein the alkali oxide in the doped rare earth disilicate layer is present in an amount between about 0.1 wt% and about 1 wt%.

48. The environmental barrier coating composition of Claim 37, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

49. The environmental barrier coating composition of Claim 37, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.

50. An environmental barrier coating composition for a ceramic matrix composite comprising:

a barium-strontium-aluminosilicate layer;

a calcium-magnesium aluminosilicate-resistant layer;

a doped rare earth disilicate layer;

wherein the calcium-magnesium aluminosilicate-resistant layer is located over the barium-strontium-aluminosilicate layer;

wherein the barium-strontium-aluminosilicate layer is located between the calcium-magnesium aluminosilicate-resistant layer and the doped rare earth disilicate layer;

wherein the doped rare earth disilicate layer is located between the barium-strontium-aluminosilicate layer and the ceramic matrix composite;

wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium,

dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 and alkali oxide;

wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate;

wherein the calcium-magnesium aluminosilicate-resistant layer comprises a rare earth oxide, alumina, and silica wherein the rare earth oxide has a composition of RE_2O_3, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the calcium-magnesium aluminosilicate-resistant layer includes an alkali oxide, Al_2O_3 and SiO_2;

wherein the calcium-magnesium aluminosilicate-resistant layer includes a dopant that includes;

wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 5 wt%; and

wherein the alkali oxide in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 1 wt%;

wherein the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 25 wt% with the balance being the rare earth oxide.

51. The environmental barrier coating composition of Claim 50, wherein the calcium-magnesium aluminosilicate-resistant layer further comprises an oxide selected from the group consisting of at least one of Ta_2O_5, TiO_2, and $HfSiO_4$.

52. The environmental barrier coating composition of Claim 50, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 3 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 20 wt%.

53. The environmental barrier coating composition of Claim 50, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 10 wt% and about 20 wt%.

54. The environmental barrier coating composition of Claim 51, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 3 wt%.

55. The environmental barrier coating composition of Claim 51, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt%.

56. The environmental barrier coating composition of Claim 50, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 0.5 mils to about 10 mils.

57. The environmental barrier coating composition of Claim 50, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 1 mil to about 3 mils.

58. The environmental barrier coating composition of Claim 50, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 3 wt%.

59. The environmental barrier coating composition of Claim 50, wherein the Al_2O_3 n the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 1 wt%.

60. The environmental barrier coating composition of Claim 50, wherein the alkali oxide in the doped rare earth disilicate layer is present in an amount between about 0.1 wt% and about 1 wt%.

61. The environmental barrier coating composition of Claim 50, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

62. The environmental barrier coating composition of Claim 50, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.

63. An environmental barrier coating composition for a ceramic matrix composite comprising:

a calcium-magnesium aluminosilicate-resistant layer;

a doped rare earth disilicate layer;

a silicon coat layer;

wherein the calcium-magnesium aluminosilicate-resistant layer is located over the doped rare earth disilicate layer;

wherein the doped rare earth disilicate layer is located between the calcium-magnesium aluminosilicate-resistant layer and the silicon coat layer;

wherein the silicon coat layer is located between the doped rare earth disilicate layer and the ceramic matrix composite;

wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 and alkali oxide;

wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate;

wherein the calcium-magnesium aluminosilicate-resistant layer comprises a rare earth oxide, alumina, and silica, wherein the rare earth oxide has a composition of RE_2O_3, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the calcium-magnesium aluminosilicate-resistant layer includes an alkali oxide, Al_2O_3 and SiO_2;

wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 5 wt%;

wherein the alkali oxide in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 1 wt%; and

wherein the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 25 wt% with the balance being the rare earth oxide.

64. The environmental barrier coating composition of Claim 63, wherein the calcium-magnesium aluminosilicate-resistant layer further comprises an oxide selected from the group consisting of at least one of Ta_2O_5, TiO_2, and $HfSiO_4$.

65. The environmental barrier coating composition of Claim 63, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 3 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 20 wt%.

66. The environmental barrier coating composition of Claim 63, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 10 wt% and about 20 wt%.

67. The environmental barrier coating composition of Claim 64, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 3 wt%.

68. The environmental barrier coating composition of Claim 64, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt%.

69. The environmental barrier coating composition of Claim 63, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 0.5 mils to about 10 mils.

70. The environmental barrier coating composition of Claim 63, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 1 mil to about 3 mils.

71. The environmental barrier coating composition of Claim 63, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 3 wt%.

72. The environmental barrier coating composition of Claim 63, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 1 wt%.

74. The environmental barrier coating composition of Claim 63, wherein the alkali oxide in the doped rare earth disilicate layer is present in an amount between about 0.1 wt% and about 1 wt%.

75. The environmental barrier coating composition of Claim 63, further comprising an uppermost top coat selected from the group consisting of a rare earth disilicate layer, a rare earth monosilicate layer, a dual-layered coat including a rare earth monosilicate layer over a rare earth disilicate layer, and a rare earth disilicate and rare earth monosilicate layer; wherein the rare earth disilicate has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium; and the monosilicate has a composition of RE_2SiO_5, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium.

76. The environmental barrier coating composition of Claim 63, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

77. The environmental barrier coating composition of Claim 63, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.

78. An environmental barrier coating composition for a ceramic matrix composite comprising:

a barium-strontium-aluminosilicate layer;

a calcium-magnesium aluminosilicate-resistant layer;

a doped rare earth disilicate layer;

a silicon coat layer;

wherein the barium-strontium-aluminosilicate layer is located over the calcium-magnesium aluminosilicate-resistant layer;

wherein the calcium-magnesium aluminosilicate-resistant layer includes an oxide selected from the group consisting of an alkali oxide and an alkali earth oxide;

wherein the calcium-magnesium aluminosilicate-resistant layer is located between the barium-strontium-aluminosilicate layer and the doped rare earth disilicate layer;

wherein the doped rare earth disilicate layer is located between the calcium-magnesium aluminosilicate-resistant layer and the silicon coat layer;

wherein the silicon coat layer is located between the doped rare earth disilicate layer and the ceramic matrix composite;

wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 and alkali oxide;

wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate;

wherein the calcium-magnesium aluminosilicate-resistant layer comprises a rare earth oxide, alumina, and silica wherein the rare earth oxide has a composition of RE_2O_3, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the calcium-magnesium aluminosilicate-resistant layer includes a dopant that is Al_2O_3 and SiO_2;

wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 5 wt%; and

wherein the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 25 wt% with the balance being the rare earth oxide.

79. The environmental barrier coating composition of Claim 78, wherein the calcium-magnesium aluminosilicate-resistant layer further comprises an oxide selected from the group consisting of at least one of Ta_2O_5, TiO_2, and $HfSiO_4$.

80. The environmental barrier coating composition of Claim 78, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 3 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 20 wt%.

81. The environmental barrier coating composition of Claim 78, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 10 wt% and about 20 wt%.

82. The environmental barrier coating composition of Claim 79, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 3 wt%.

83. The environmental barrier coating composition of Claim 79, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt%.

84. The environmental barrier coating composition of Claim 78, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 0.5 mils to about 10 mils.

85. The environmental barrier coating composition of Claim 78, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 1 mil to about 3 mils.

86. The environmental barrier coating composition of Claim 78, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 3 wt%.

87. The environmental barrier coating composition of Claim 78, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 1 wt%.

88. The environmental barrier coating composition of Claim 78, wherein the alkali oxide in the doped rare earth disilicate layer is present in an amount between about 0.1 wt% and about 1 wt%.

89. The environmental barrier coating composition of Claim 78, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

90. The environmental barrier coating composition of Claim 78, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.

91. An environmental barrier coating composition for a ceramic matrix composite comprising:

a barium-strontium-aluminosilicate layer;

a calcium-magnesium aluminosilicate-resistant layer;

a doped rare earth disilicate layer;

a silicon coat layer;

wherein the calcium-magnesium aluminosilicate-resistant layer is located over the barium-strontium-aluminosilicate layer;

wherein the barium-strontium-aluminosilicate layer is located

between the calcium-magnesium aluminosilicate-resistant layer and the doped rare earth disilicate layer;

wherein the doped rare earth disilicate layer is located between the barium-strontium-aluminosilicate layer and the silicon coat layer;

wherein the silicon coat layer is located between the doped rare earth disilicate layer and the ceramic matrix composite;

wherein the doped rare earth disilicate layer includes a disilicate that has a composition of $RE_2Si_2O_7$, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the calcium-magnesium aluminosilicate-resistant layer includes an oxide selected from the group consisting of an alkali oxide and an alkali earth oxide;

wherein the doped rare earth disilicate layer includes a dopant that is Al_2O_3 and alkali oxide;

wherein the dopant is present in an amount between about 0.1 wt% and about 5 wt%, and the balance of the doped rare earth disilicate layer being the disilicate;

wherein the calcium-magnesium aluminosilicate-resistant layer comprises a rare earth oxide, alumina, and silica wherein the rare earth oxide has a composition of RE_2O_3, wherein RE is selected from the group consisting of at least one of lutetium, ytterbium, thulium, erbium, holmium, dysprosium, terbium, gadolinium, europium, samarium, promethium, neodymium, praseodymium, cerium, lanthanum, yttrium, and scandium;

wherein the calcium-magnesium aluminosilicate-resistant layer includes a dopant that is Al_2O_3 and SiO_2;

wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 5 wt%; and

wherein the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 25 wt% with the balance being the rare earth oxide.

92. The environmental barrier coating composition of Claim 91, wherein the calcium-magnesium aluminosilicate-resistant layer further comprises an oxide selected from the group consisting of at least one of Ta_2O_5, TiO_2, and $HfSiO_4$.

93. The environmental barrier coating composition of Claim 91, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 3 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 5 wt% and about 20 wt%.

94. The environmental barrier coating composition of Claim 91, wherein the Al_2O_3 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt% and the SiO_2 in the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 10 wt% and about 20 wt%.

95. The environmental barrier coating composition of Claim 92, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.1 wt% and about 3 wt%.

96. The environmental barrier coating composition of Claim 92, wherein the oxide of the calcium-magnesium aluminosilicate-resistant layer is present in an amount between about 0.5 wt% and about 1 wt%.

97. The environmental barrier coating composition of Claim 91, wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 0.5 mils to about 10 mils.

98. The environmental barrier coating composition of Claim 91 wherein the calcium-magnesium aluminosilicate-resistant layer has a thickness of between about 1 mil to about 3 mils.

99. The environmental barrier coating composition of Claim 91, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 3 wt%.

100. The environmental barrier coating composition of Claim 91, wherein the Al_2O_3 in the doped rare earth disilicate layer is present in an amount between about 0.5 wt% and about 1 wt%.

101. The environmental barrier coating composition of Claim 91, wherein the alkali oxide in the doped rare earth disilicate layer is present in an amount between about 0.1 wt% and about 1 wt%.

102. The environmental barrier coating composition of Claim 91, wherein the doped rare earth disilicate layer has a thickness of between about 0.5 mils to about 10 mils.

103. The environmental barrier coating composition of Claim 91, wherein the doped rare earth disilicate layer has a thickness of between about 1 mil to about 3 mils.