CLAIMS

1. A cyclohexylbenzene composition comprising cyclohexylbenzene at a concentration of C(CHB) wt% and methylcyclopentylbenzene at a concentration of C(MCPB) ppm, where the percentage and ppm are based on the total weight of the cyclohexylbenzene composition, C(CHB) $\geqslant$ 95.00, and 0.001 $\leqslant$ C(MCPB) $\leqslant$ 5000, and

wherein the methylcyclopentylbenzene comprises (a) cis-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2cis) ppm and (b) trans-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2trans) ppm, and C(MCPB2trans) $\leqslant$ C(MCPB2cis).

2. The cyclohexylbenzene composition of claim 1, wherein the methylcyclopentylbenzene comprises (a) cis-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2cis) ppm and (b) trans-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2trans) ppm, and at least one of the following conditions (i), (ii), and (iii) is met:

(i) 0.001 $\leqslant$ C(MCPB2cis) $\leqslant$ 4500;

(ii) 0.001 $\leqslant$ C(MCPB2trans) $\leqslant$ 4500; and

(iii) 0.001 $\leqslant$ C(MCPB2cis) + C(MCPB2trans) $\leqslant$ 4500.

3. The cyclohexylbenzene composition of claim 1 or claim 2, wherein 0.010 $\leqslant$ C(MCPB) $\leqslant$ 1000.

4. The cyclohexylbenzene composition of any of the preceding claims 1, 2 and 3, wherein 1.5 $\leqslant$ C(MCPB2cis)/C(MCPB2trans) $\leqslant$ 1000.

5. The cyclohexylbenzene composition of any of the preceding claims, wherein the methylcyclopentylbenzene comprises (a) cis-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2cis) ppm; (b) trans-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2trans) ppm; (c) cis-1-methyl-3-phenylcyclopentane at a concentration of C(MCPB3cis) ppm; and (d) trans-1-methyl-3-phenylcyclopentane at

a concentration of C(MCPB3trans) ppm, and at least one of the following conditions (i), (ii), (iii), and (iv) is met:

(i) C(MCPB2cis) + C(MCPB2trans) > C(MCPB3cis) + C(MCPB3trans);

(ii) 1.5 ⩽ C(MCPB2trans)/(C(MCPB3cis) + C(MCPB3trans)) ⩽ 1000;

(iii) 1.5 ⩽ C(MCPB2cis)/(C(MCPB3cis) + C(MCPB3trans)) ⩽ 1000; and

(iv) 1.5 ⩽ (C(MCPB2cis) + C(MCPB2trans))/(C(MCPB3cis) + C(MCPB3trans)) ⩽ 1000.

6. The cyclohexylbenzene composition of any of the preceding claims, wherein the methylcyclopentylbenzene comprises (a) cis-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2cis) ppm; (b) trans-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2trans) ppm; and (c) 1-methyl-1-phenylcyclopentane at a concentration of C(MCPB1) ppm; and at least one of the following conditions (i), (ii), (iii), and (iv) is met:

(i) C(MCPB2cis) + C(MCPB2trans) > C(MCPB1);

(ii) C(MCPB2trans) > C(MCPB1);

(iii) 1.5 ⩽ C(MCPB2trans)/C(MCPB1) ⩽ 1000; and

(iv) 1.5 ⩽ (C(MCPB2cis) + C(MCPB2trans))/(C(MCPB1) ⩽ 1000.

7. The cyclohexylbenzene composition of any of the preceding claims, wherein the methylcyclopentylbenzene comprises (a) cis-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2cis) ppm; (b) trans-1-methyl-2-phenylcyclopentane at a concentration of C(MCPB2trans) ppm; (c) 1-methyl-1-phenylcyclopentane at a concentration of C(MCPB1) ppm; (d) cis-1-methyl-3-phenylcyclopentane at a concentration of C(MCPB3cis) ppm; and (e) trans-1-methyl-3-phenylcyclopentane at a concentration of C(MCPB3trans) ppm, and at least one of the following conditions (i), (ii), and (iii) is met:

(i) C(MCPB2cis) + C(MCPB2trans) > C(MCPB1) + C(MCPB3cis) + C(MCPB3trans);

(ii) 1.5 ⩽ C(MCPB2trans)/(C(MCPB1) + C(MCPB3cis) + C(MCPB3trans)) ⩽ 1000; and

(iii) $1.5 \leqslant (C(MCPB2cis) + C(MCPB2trans))/(C(MCPB1) + C(MCPB3cis) + C(MCPB3trans)) \leqslant 1000$.

8. The cyclohexylbenzene composition of any of the preceding claims, wherein the methylcyclopentylbenzene comprises cis-1-methyl-3-phenylcyclopentane at a concentration of C(MCPB3cis) ppm and trans-1-methyl-3-phenylcyclopentane at a concentration of C(MCPB3trans) ppm, and at least one of the following conditions (i), (ii), and (iii) is met:

(i) $0.001 \leqslant C(MCPB3cis) \leqslant 4500$;

(ii) $0.001 \leqslant C(MCPB3trans) \leqslant 4500$; and

(iii) $0.001 \leqslant C(MCPB3cis) + C(MCPB3trans) \leqslant 4500$.

9. The cyclohexylbenzene composition of any of the preceding claims, wherein the methylcyclopentylbenzene comprises 1-methyl-1-phenylcyclopentane at a concentration of C(MCPB1) ppm, and $0.001 \leqslant C(MCPB1) \leqslant 4500$.

10. The cyclohexylbenzene composition of any of the preceding claims, further comprising phenol at a concentration no greater than 50 ppm, expressed in terms of weight of phenol on the basis of the total weight of the cyclohexylbenzene composition.

11. The cyclohexylbenzene composition of any of the preceding claims, further comprising cyclohexenylbenzene at a concentration no greater than 50 ppm, expressed in terms of weight of cyclohexenylbenzene on the basis of the total weight of the cyclohexylbenzene composition.