**CLAIMS:**

1. A process for the preparation of a high assay decabromodiphenylalkane product which as produced has an occluded free bromine content of no more than 500 ppm, which process comprises brominating, in a liquid phase reaction mixture,

at least one diphenylalkane in which the alkylene group contains in the range of 1 to 10 carbon atoms,

with bromine,

in the presence of an aluminum, aluminum halide or a ferric halide catalyst in which the halogen atoms of such halides, as used in forming the charge thereof into said reaction mixture are chlorine atoms, bromine atoms, or both,

wherein an excess of bromine is used in the process and wherein the maximum excess amount of bromine used in the process is about 20 mole % relative to the stoichiometric amount required to convert the diphenylalkane to the decabromodiphenylalkane product,

wherein the temperature of the bromination reaction mixture is maintained in the range of 45 to 98°C at least during the mixing of the bromine and the diphenylalkane, and

whereby the high assay decabromodiphenylalkane product is prepared without use of procedures to reduce the occluded free bromine content.

2. A process as in Claim 1 wherein a solution of the diphenylalkane in an inert solvent is fed into a reactor or reaction zone containing said limited excess of bromine, said catalyst, and more inert solvent.

3. A process as in Claim 1 wherein feeds of (i) a solution of the diphenylalkane in an inert solvent and (ii) bromine are separately and concurrently fed into a reactor or reaction zone containing said catalyst and more inert solvent.

4. A process as in Claim 1 wherein the catalyst is an aluminum trihalide in which the halogen atoms are bromine atoms, chlorine atoms, or both, and wherein the amount of said catalyst charged is in the range of 0.1 to 5 mole % based on the total moles of bromine employed in the process.

5. A process as in Claim 4 wherein the diphenylalkane selected for use in the process is 1,2-diphenylethane or 1,3-diphenylpropane, or both, wherein the catalyst selected for use in the process is aluminum chloride or aluminum bromide, or both, and wherein the amount of said catalyst charged is in the range of 0.75 to 2.0 mole % based on the total moles of bromine employed in the process.

6. A process as in Claim 4 wherein the diphenylalkane selected for use in the process is 1,2-diphenylethane or 1,3-diphenylpropane, or both, wherein the catalyst selected for use in the process is aluminum chloride or aluminum bromide, or both, and wherein the amount of said catalyst charged is 0.3 to 1.0 mole %, based on the total moles of bromine employed in the process.

7. A process as in Claim 1 wherein the amount of said catalyst charged is in the range of 0.75 to 2.0 mole% based on the total moles of bromine employed in the process.

8. A process as in Claim 7 wherein said amount of said catalyst charged is in the range of 0.5 to 1.5 mole% based on the total moles of bromine employed in the process.

9. A process as in Claim 7 wherein said amount of said catalyst charged is in the range of 0.3 to 1.0 mole% based on the total moles of bromine employed in the process.

10. A process as in Claim 1 wherein said temperature of the bromination reaction mixture is maintained at 60 to 95°C at least during the mixing of the bromine and the diphenylalkane.

11. A process as in Claim 1 wherein the process is conducted on a batch basis, wherein a post reaction period following completion of the addition of the feed(s) is provided, and wherein the length of such period ranges from 0.5 to 2 hours.

12. A process as in Claim 3 which comprises controlling the molar ratio of bromine to diphenylalkane so as to be substantially continuously at about the maximum molar ratio of bromine:diphenylalkane as these components come together in the reaction zone, whereby excess heat build-up and excess hydrogen bromide evolution do not occur.

13. A process as in Claim 1 wherein the maximum excess amount of bromine used in the process is about 15 mole % relative to the stoichiometric amount required to convert the diphenylalkane to the decabromodiphenyalkane product.

14. A process as in Claim 13 wherein the diphenylalkane is diphenylethane and the decabromodiphenyalkane product is a decabromoethane product.



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**CLAIMS:**

1. A process for the preparation of a high assay decabromodiphenylalkane product which as produced has an occluded free bromine content of no more than 500 ppm, which process comprises brominating, in a liquid phase reaction mixture,

at least one α,ω-diphenylalkane in which the alkylene group contains in the range of 1 to about 10 carbon atoms,

with bromine,

in the presence of an aluminum, aluminum halide or a ferric halide catalyst in which the halogen atoms of such halides, as used in forming the charge thereof into said reaction mixture are chlorine atoms, bromine atoms, or both,

wherein the maximum excess amount of bromine used in the process is about 20 mole % relative to the stoichiometric amount required to convert the α,ω-diphenylalkane to the decabromodiphenylalkane product,

wherein the temperature of the bromination reaction mixture is maintained in the range of about 45 to about 98°C at least during the mixing of the bromine and the α,ω-diphenylalkane, and

whereby the high assay decabromodiphenylalkane product is prepared without use of procedures to reduce the occluded free bromine content.

2. A process as in Claim 1 wherein a solution of the α,ω-diphenylalkane in an inert solvent is fed into a reactor or reaction zone containing said limited excess of bromine, said catalyst, and inert solvent.

3. A process as in Claim 1 wherein feeds of (i) a solution of the α,ω-diphenylalkane in an inert solvent and (ii) bromine are separately and concurrently fed into a reactor or reaction zone containing said catalyst and inert solvent.

4. A process as in any of Claims 1-3 wherein the catalyst is an aluminum trihalide in which the halogen atoms are bromine atoms, chlorine atoms, or both, and wherein the amount of said catalyst is in the range of about 0.1 to about 5 mole % based on the total moles of bromine employed in the process.

5. A process as in Claim 4 wherein the α,ω-diphenylalkane selected for use in the process is 1,2-diphenylethane or 1,3-diphenylpropane, or both, wherein the catalyst



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selected for use in the process is aluminum chloride or aluminum bromide, or both, and wherein the amount of said catalyst is in the range of about 0.75 to about 2.0 mole % based on the total moles of bromine employed in the process.

6. A process as in Claim 4 wherein the α,ω-diphenylalkane selected for use in the process is 1,2-diphenylethane or 1,3-diphenylpropane, or both, wherein the catalyst selected for use in the process is aluminum chloride or aluminum bromide, or both, and wherein the amount of said catalyst is about 0.3 to about 1.0 mole %, based on the total moles of bromine employed in the process.



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