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Composition of Matter

- (1) French Addition 82,329, to Progil (addition to French 1,316,501) - mixing 2,4' dichlorobiphenyl with tri- and tetrachlorobiphenyl.
- (2) French 1,316,501, 2/1/63, to Progil -- basic patent on 2,4' dichlorobiphenyl and mixtures thereof.
- (3) U.S. 3,038,107, to Monsanto, 6/5/62 -- 2,4' isomer and its combination -- probably a basic patent for Aroclor M-DK.
- (4) U.S. 2,977,516, to Monsanto, 5/28/61 -- mixtures containing 2,3,2' and 3,4,2' isomers -- object, improved dielectric constant.

Isomerization

- (1) U.S. 3,068,297, to Monsanto, 12/11/62 -- elevated temperature isomerization in presence of Lewis acids -- esp. relates to isomerization of 2,2' dihalobiphenyls to 2,3' and 2,4' isomers -- object is to improve dielectric constant.
- (2) J. Org. Chem. 27, 2024-26 (1962). By Weingarten of Monsanto -- $AlCl_3$ induced isomerization of chlorobiphenyls. A pure isomer is converted to a mixture of isomers.

Additives

- (1) German 869,823, 3/9/53 -- stabilization in capacitors by prior partial air oxidation - same type thinking as adding anthraquinone.
- (2) U.S. 2,757,141, to Sprague Elec., 7/31/56 -- adding 0.1 to 5% azobiphenyl as inhibitor in capacitor impregnants.
- (3) U.S. 2,536,006, to Sprague Electric, 3/21/53 -- adding 0.5 to 2% organic nitrosamine or nitroso compound. U.S. 636,074 -- adding selected conjugated hydrocarbons.
- (4) U.S. 2,617,770, to Monsanto, 11/11/52 -- adding amine scavengers for capacitors, transformers, etc. (note: Ind. & Eng. Chem. 40, 117 (1948) indicates amines are harmful!)
- (5) U.S. 2,532,616, to Monsanto, 12/5/50 -- adding 0.1% zinc dimethyldithiocarbamate inhibitor.

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Chlorination

- (1) U.S. 3,029,295, to Societe d'Electro-Chemie, 4/10/62. Vapor phase chlorination in a fluidized bed (e.g. CuCl_2 on carbon).
- (2) German 954,366, to Farbenfabriken Bayer, 12/13/56. Using MnO_2 catalyst, get a product almost free of undesirable 4,4' isomer.
- (3) U.S. 2,854,813, to Monsanto, 8/1/44 -- preparation from nitro-substituted diphenyls.
- (4) U.S. 2,812,319, to Swann Research, 10/29/56 -- a mild vapor phase chlorination.
- (5) U.S. 2,846,040, to Dow Chemical -- liquid phase chlorination using catalysts S, SbCl_3 , Pb.
- (6) British 1,088,818, to ICI, 7/6/55 -- an interesting vapor phase chlorination.
- (7) U.S. 2,842,597, to Swann Research, 12/27/52 -- liquid phase using iron catalyst bed.
- (8) British 1,360,840 (also French 716,621), to I.G. Farbenindustrie -- using as catalyst SbCl_3 , FeCl_3 or PCl_5 -- esp. at low temp.

Purification

- (1) British 1,175,150, to Cufent, 11/11/64 -- Process for electrolytically purifying dielectric liquids and for maintaining their purity during storage. DC voltage is applied across immersed plates of ions rapidly removing electrodes. U.S. application made 4/8/61.
- (2) German 1,178,885, to Farbenfabriken Bayer, 2/9/56 -- Treatment with decomposition products of esters of amphoteric metals or compounds (e.g. $\text{Al}(\text{OH})_3$) - includes lining storage tanks with glass. A variation is given in German 938,742, same assignee.
- (3) U.S. 2,843,805, to General Electric, 7/13/48 -- Aging 5 hrs. at 100-200°C in presence of catalyst. Also covers some adsorbents.
- (4) U.S. 2,757,123, to U.S. Government, 4/12/41 -- covers a variety of catalysts and adsorbents designed for purification of halo-organic compounds.
- (5) U.S. 2,794,102, to General Electric, 3/12/55 -- covers treatment with titanium, zirconium, stannous, etc.

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Additives (cont.)

- (6) Ind. & Eng. Chem. 40, 117 (1948) -- surveys 41 compounds as additives to stabilize paper capacitors -- postulates mechanism of action of anthraquinone, etc.
- (7) U.S. 3,525,475, to Westinghouse -- adding 0.5% nitrobenzil as additive.

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