

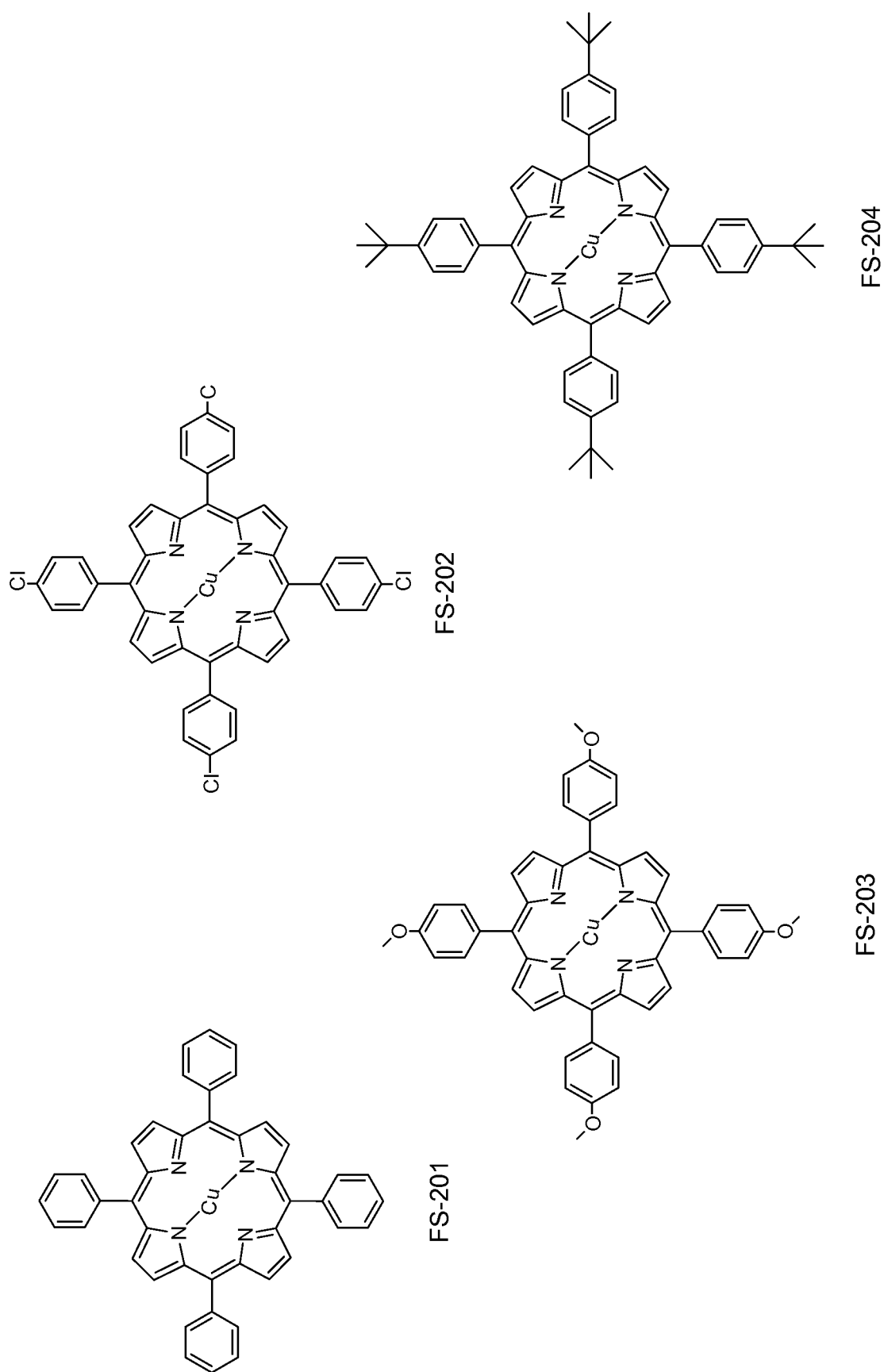


FIG. 1A

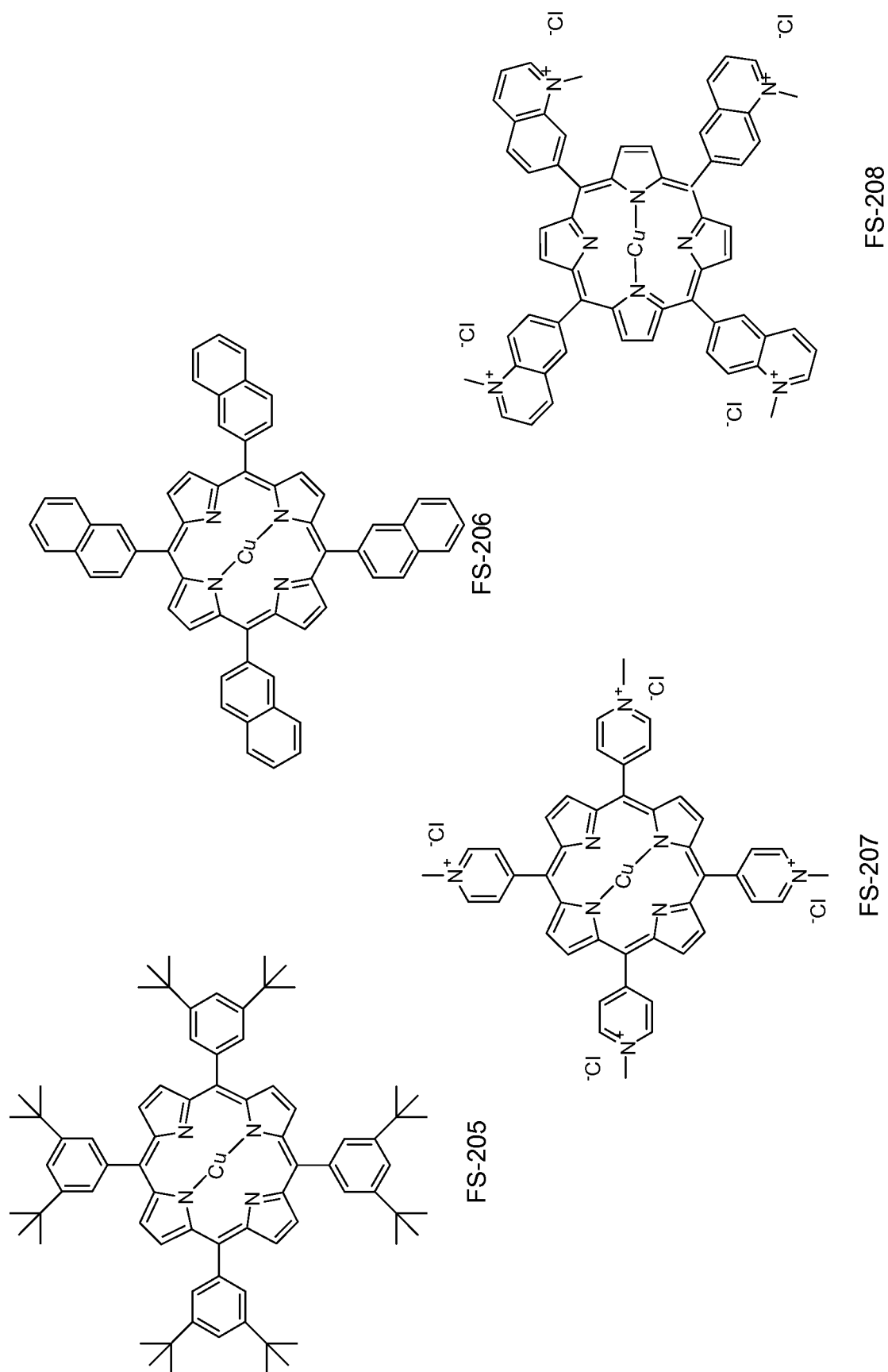


FIG. 1B

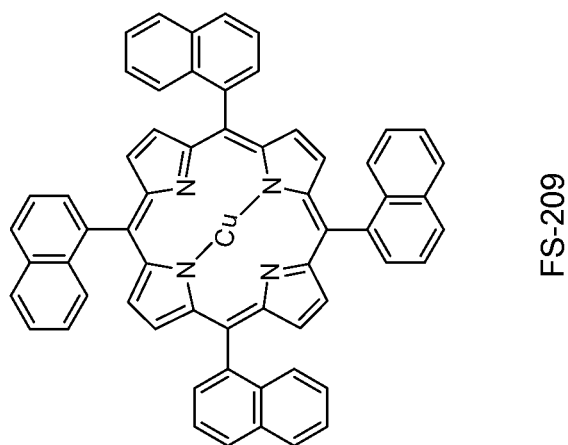
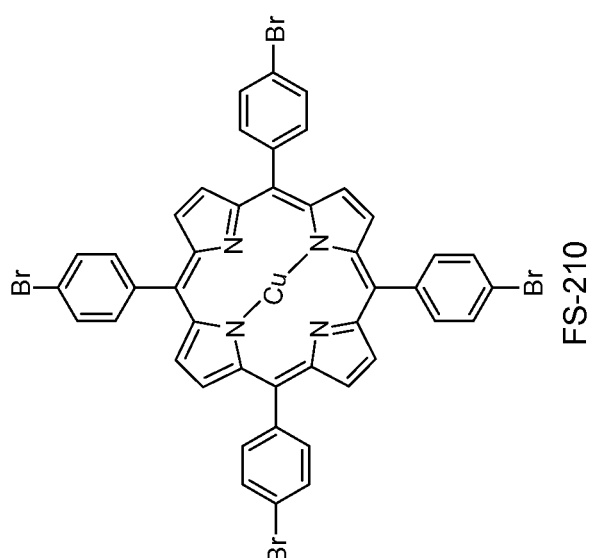


FIG. 1C

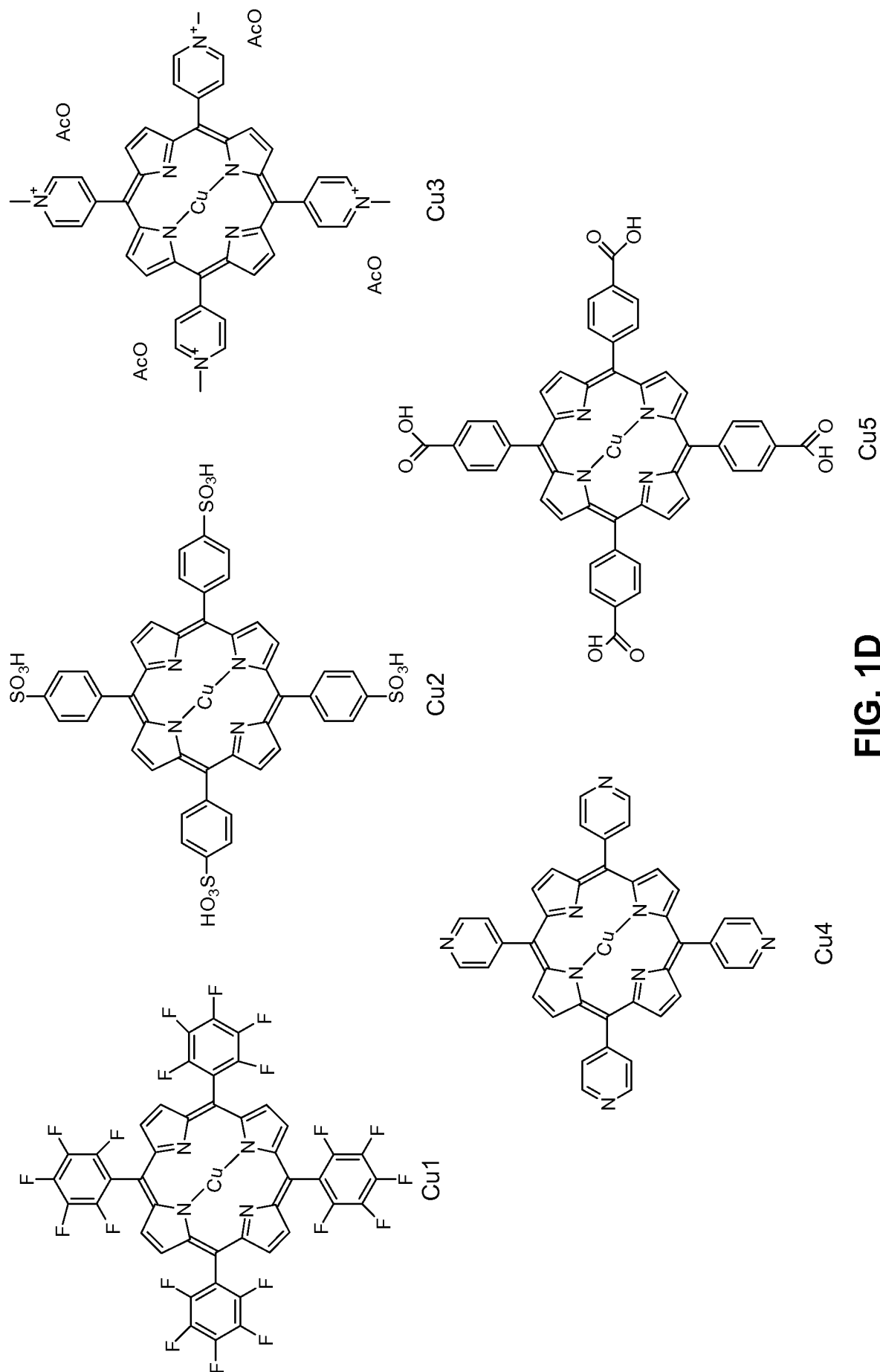


FIG. 1D

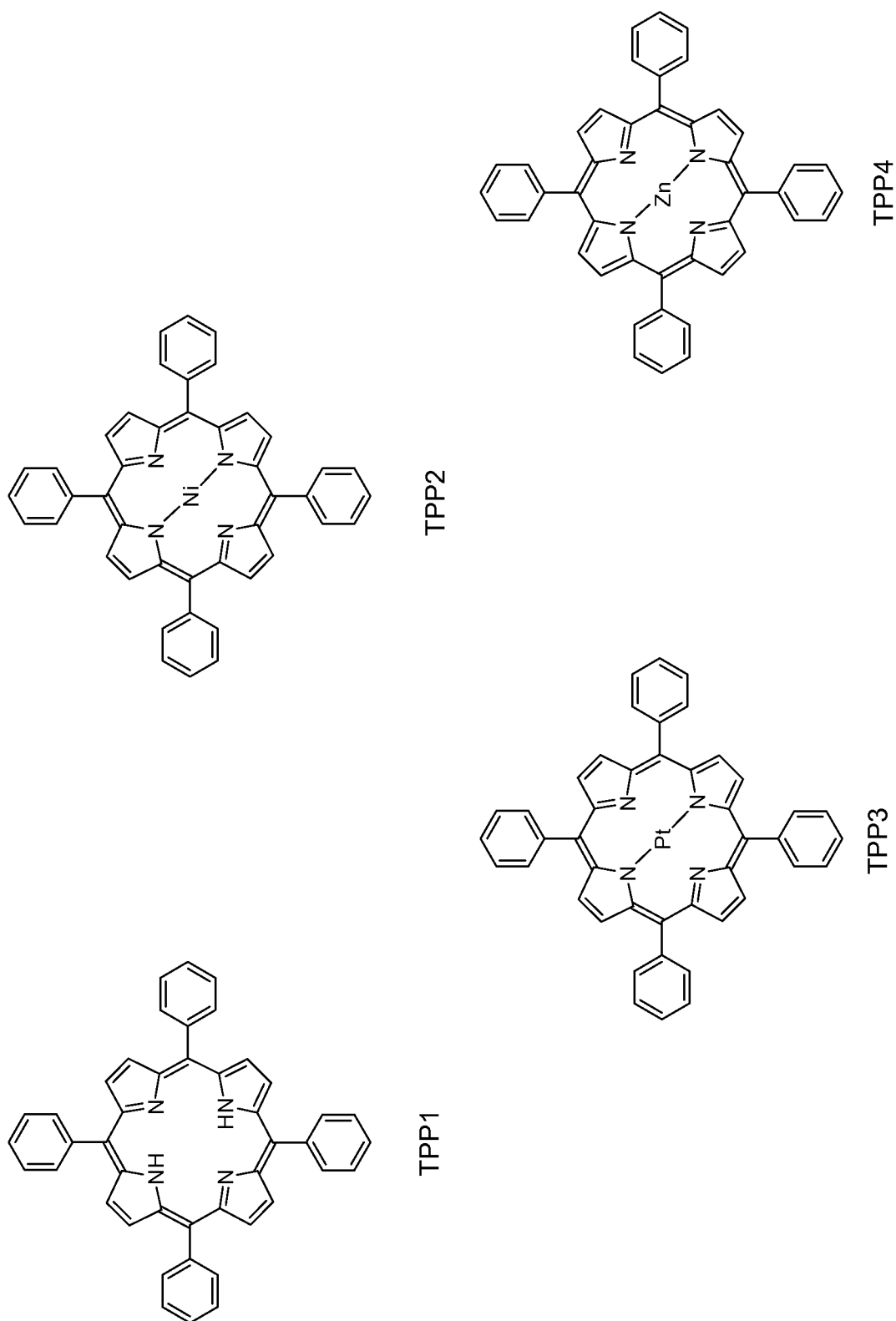


FIG. 2A

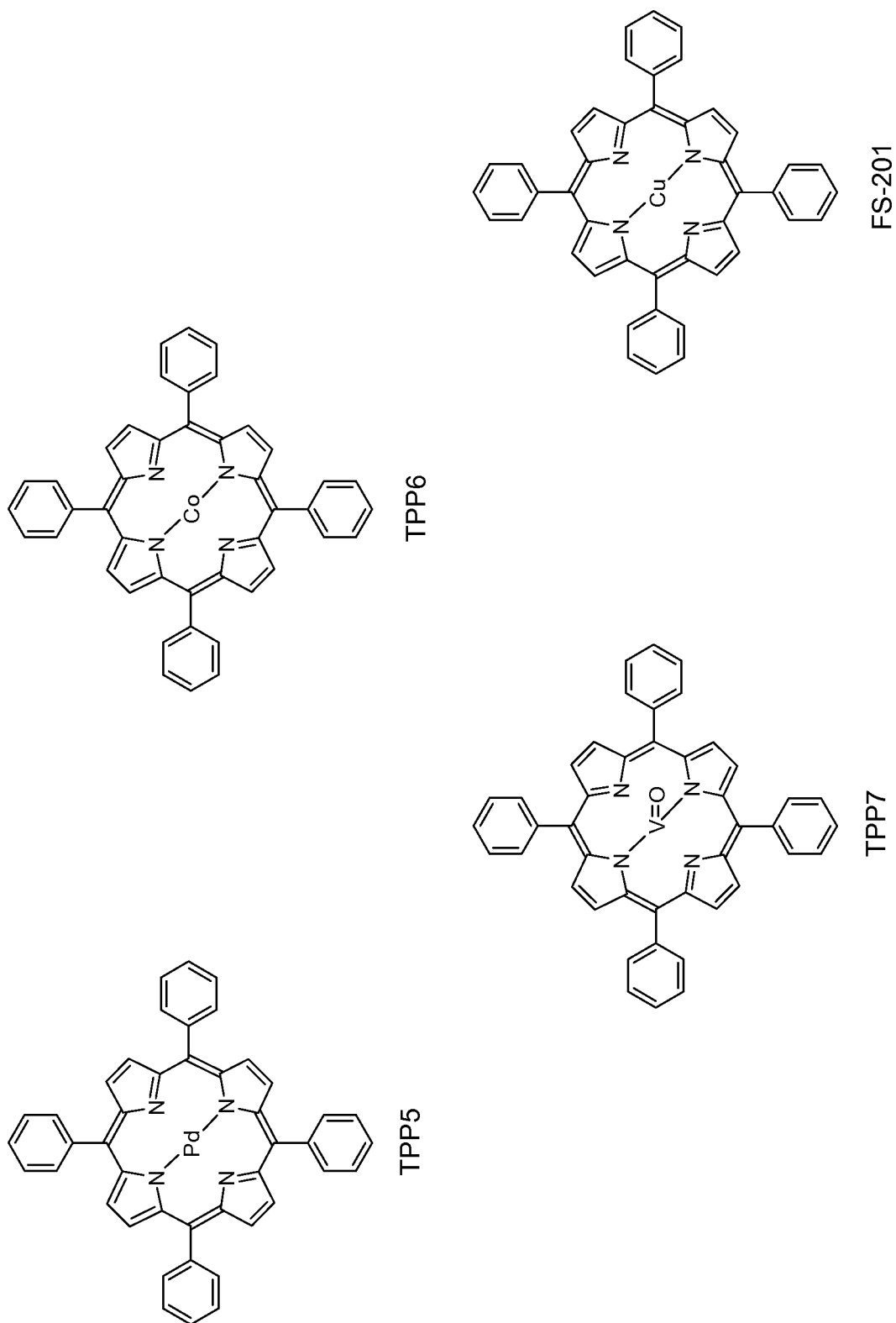


FIG. 2B

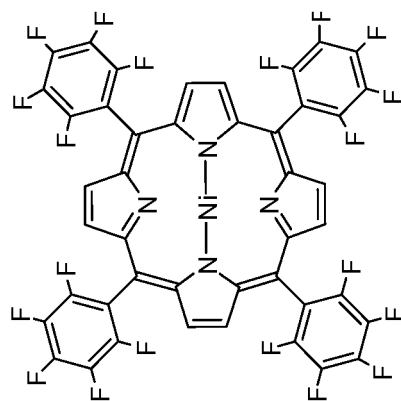
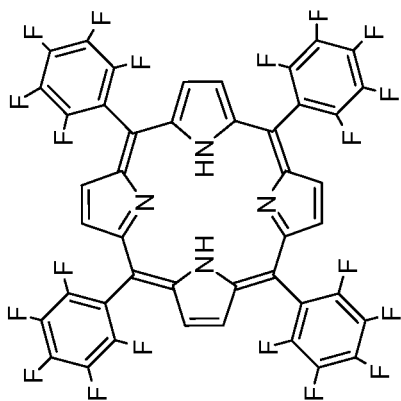
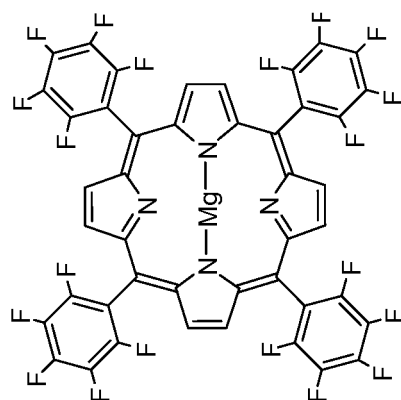
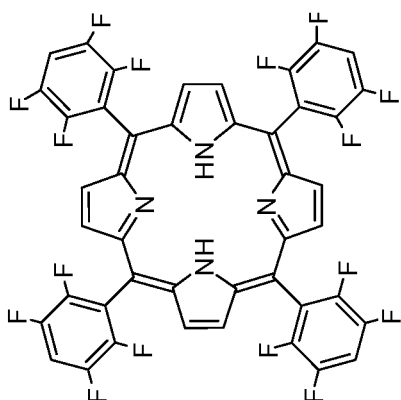
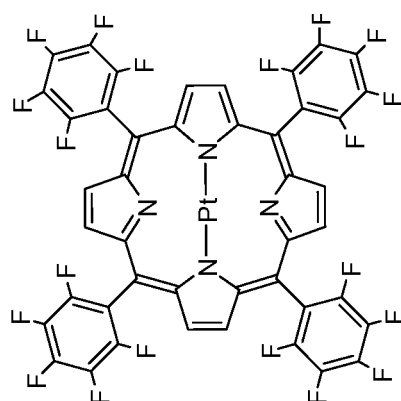
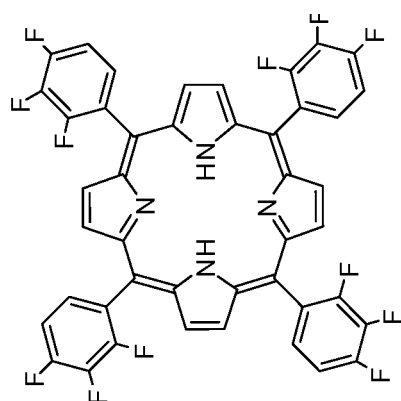


FIG. 3A

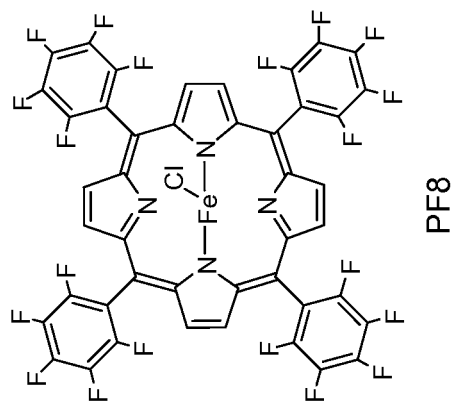
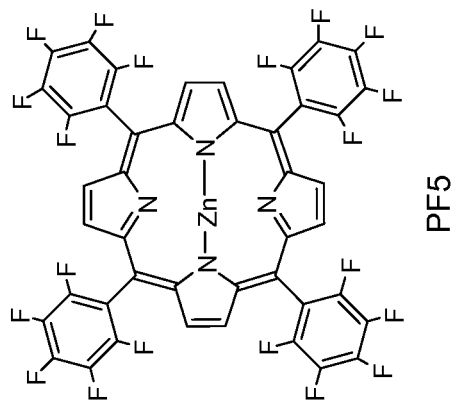
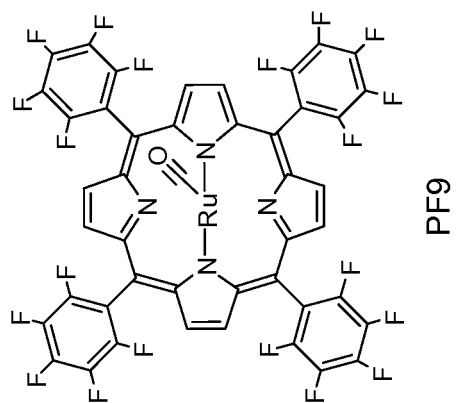
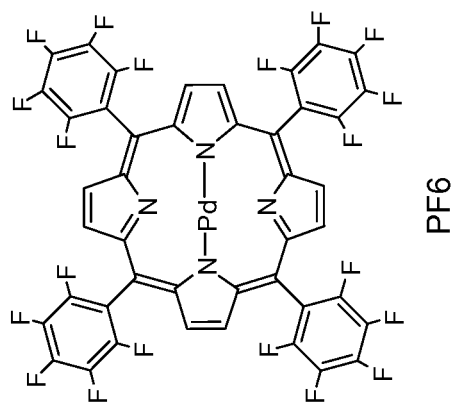
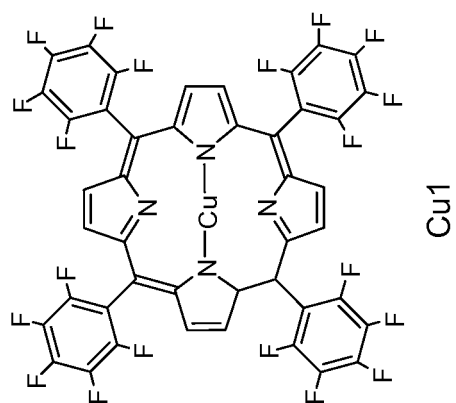
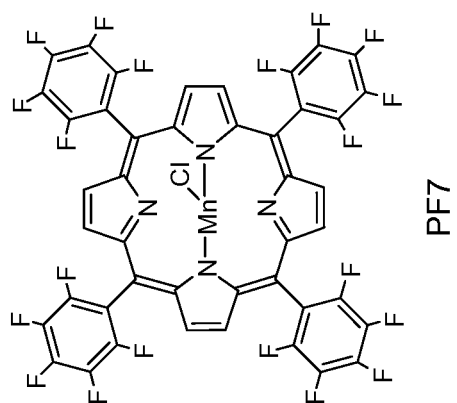


FIG. 3B

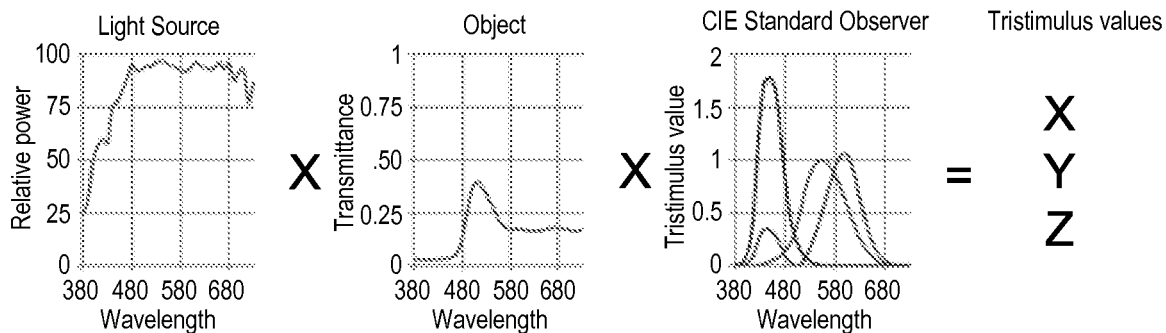


FIG. 4

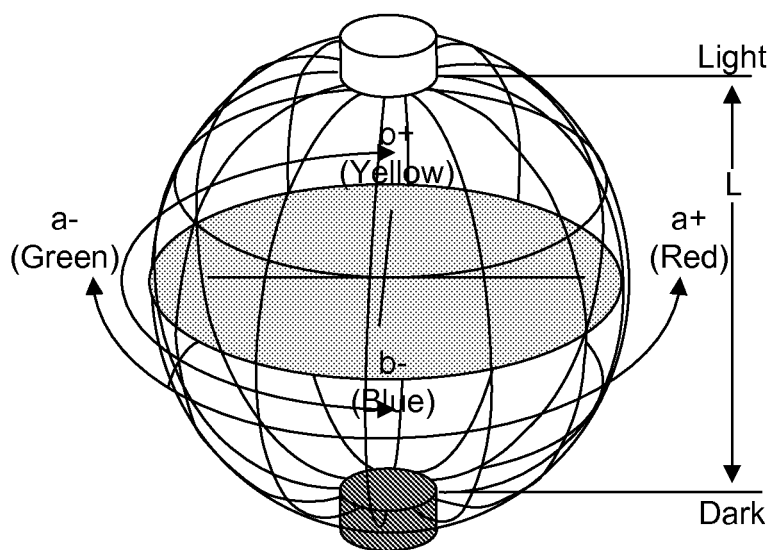


FIG. 5A

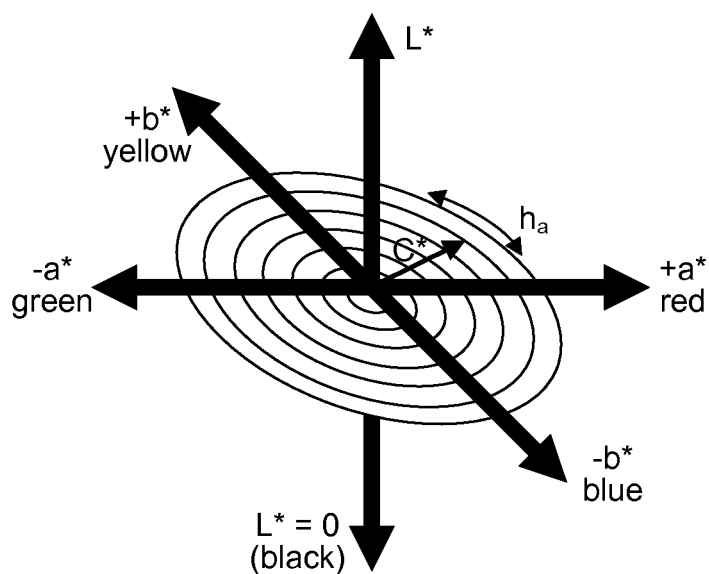


FIG. 5B

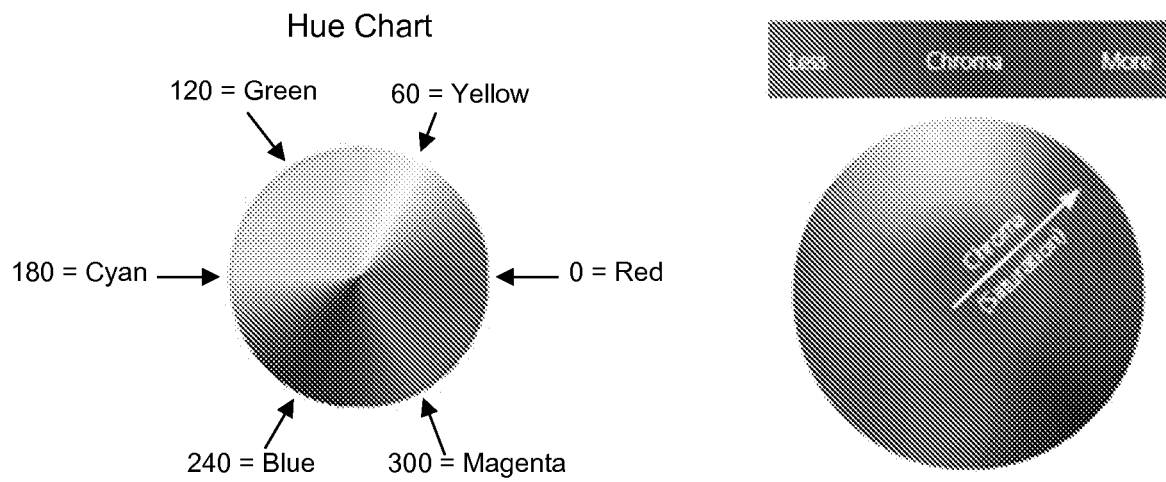


FIG. 6

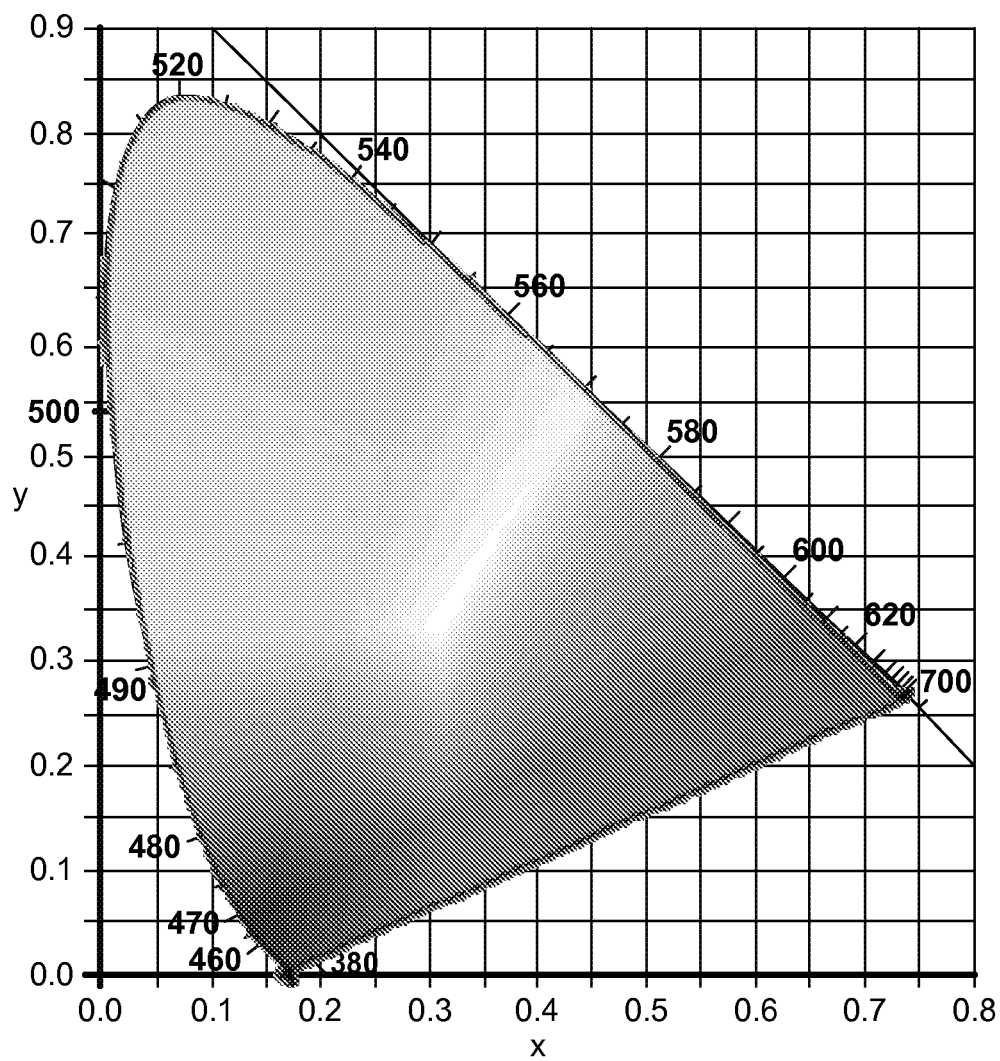


FIG. 7

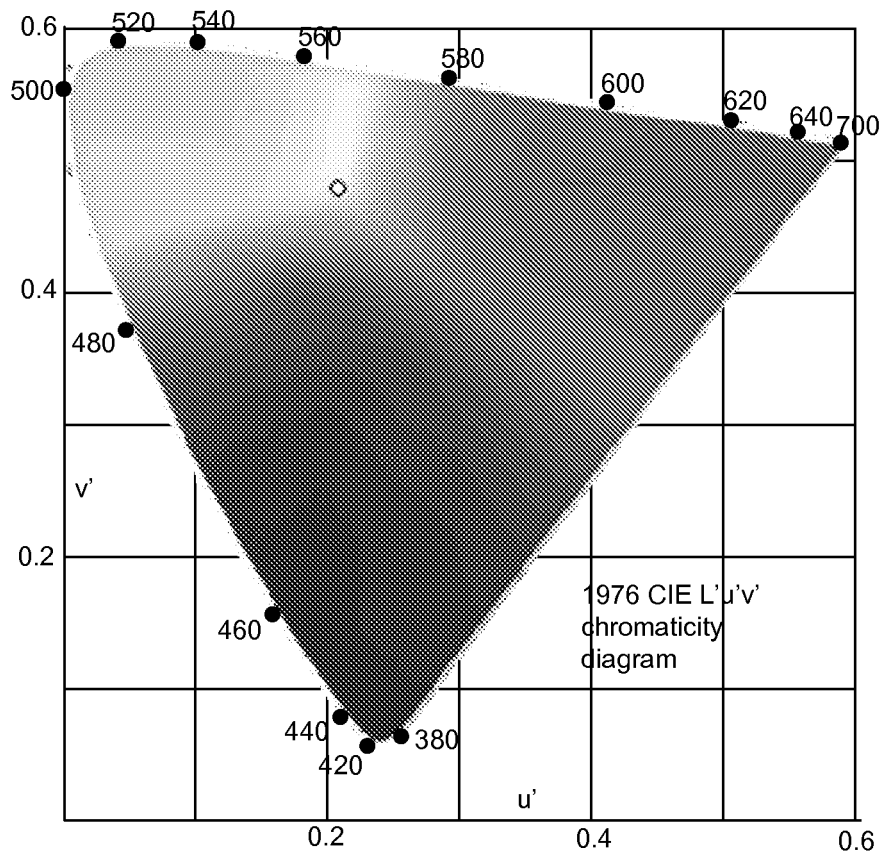


FIG. 8

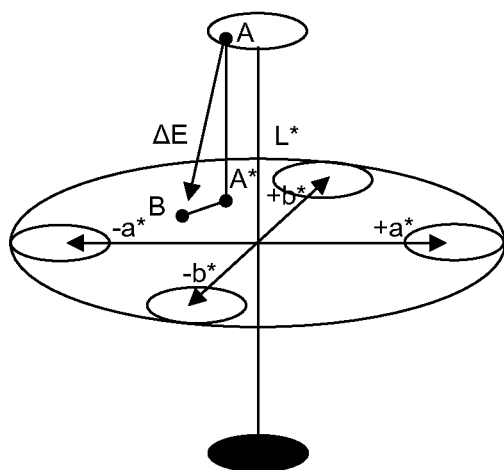


FIG. 9A

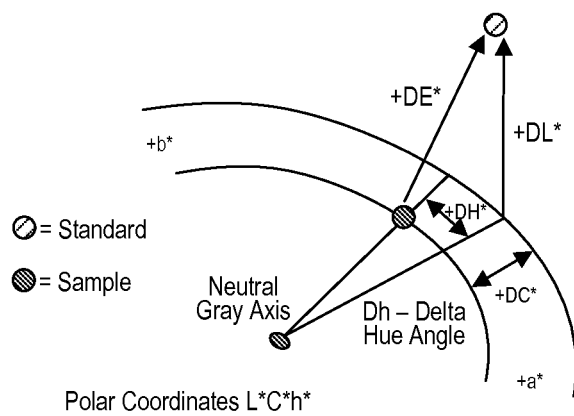


FIG. 9B

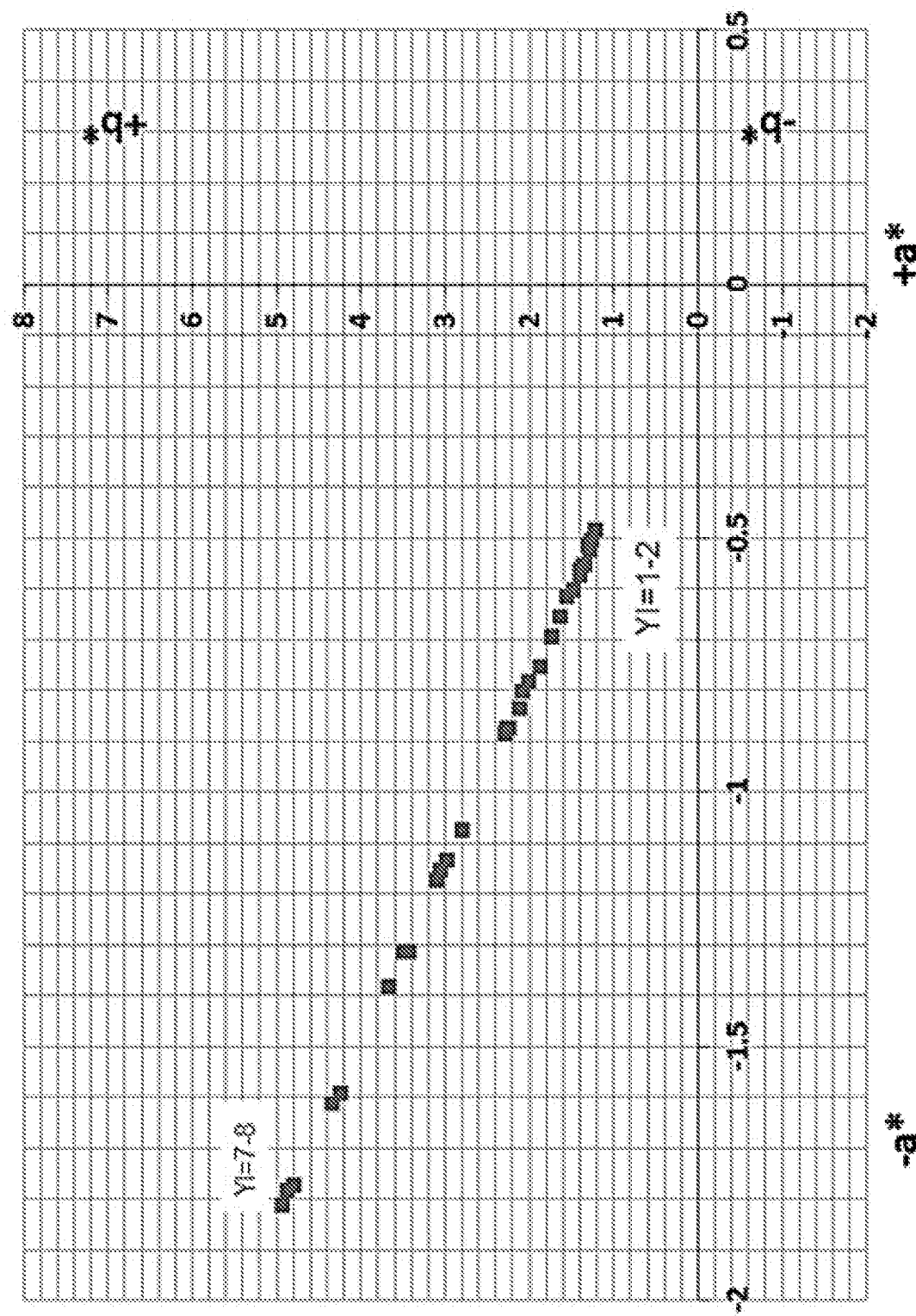


FIG. 10

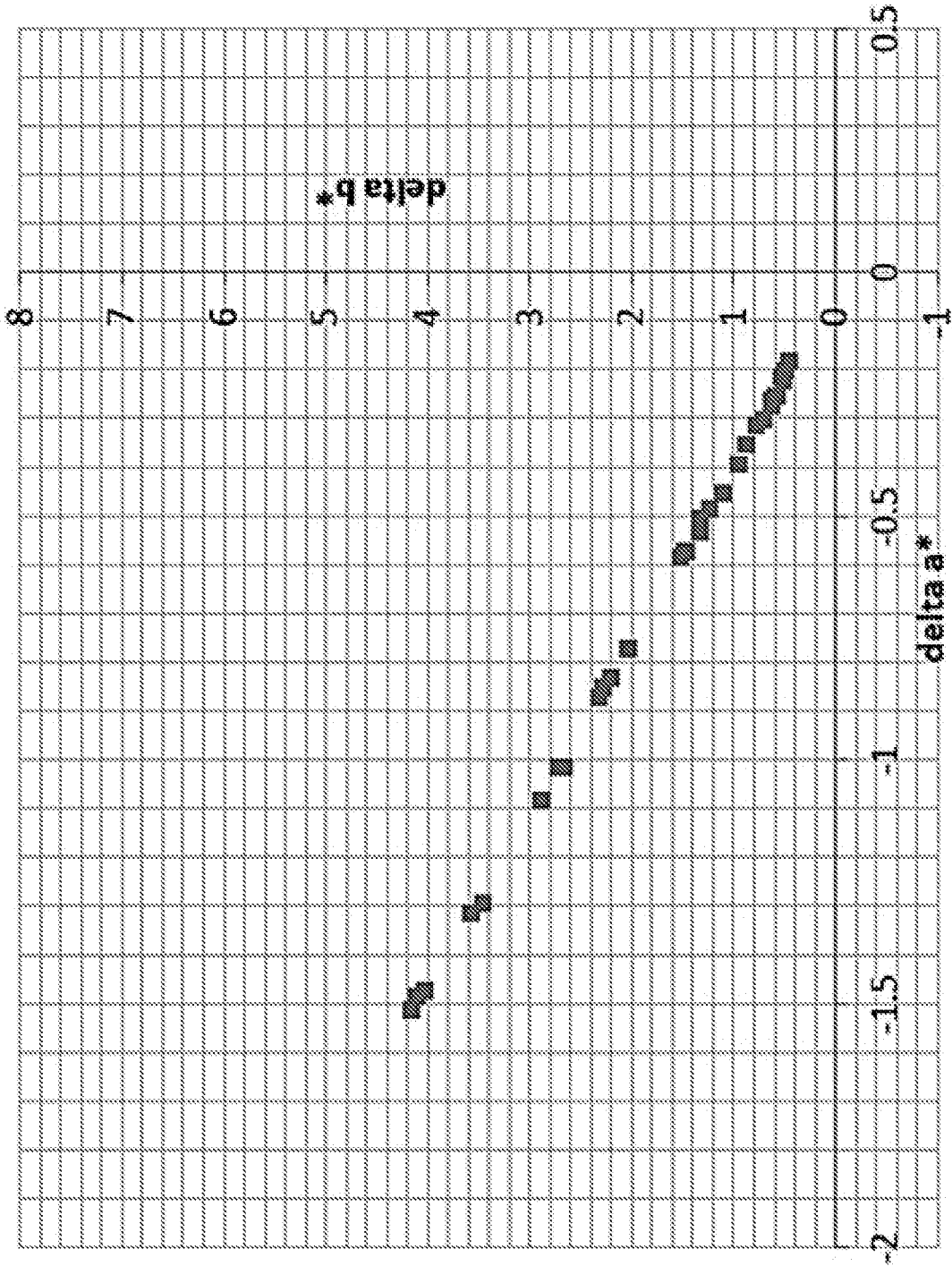


FIG. 11

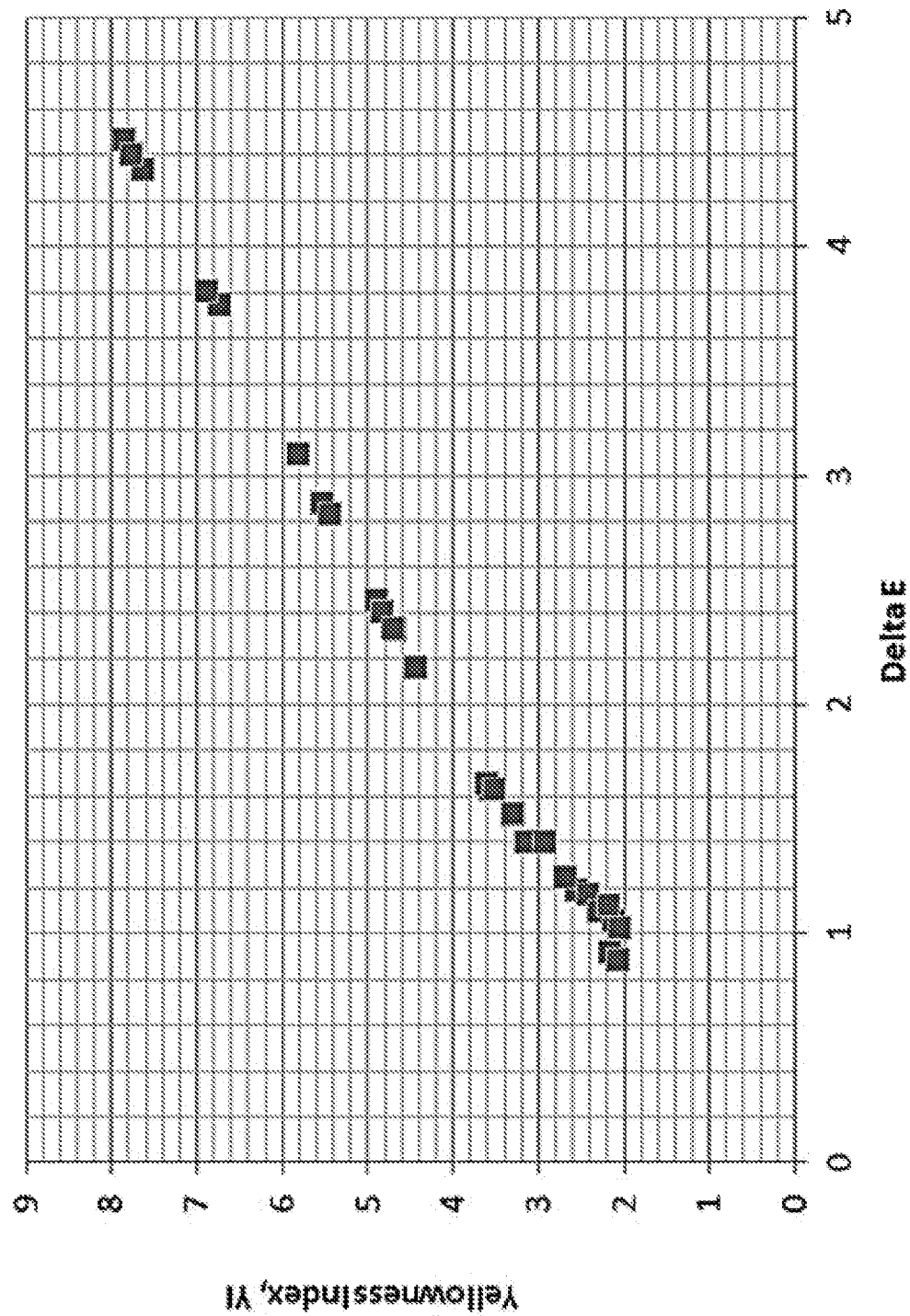


FIG. 12

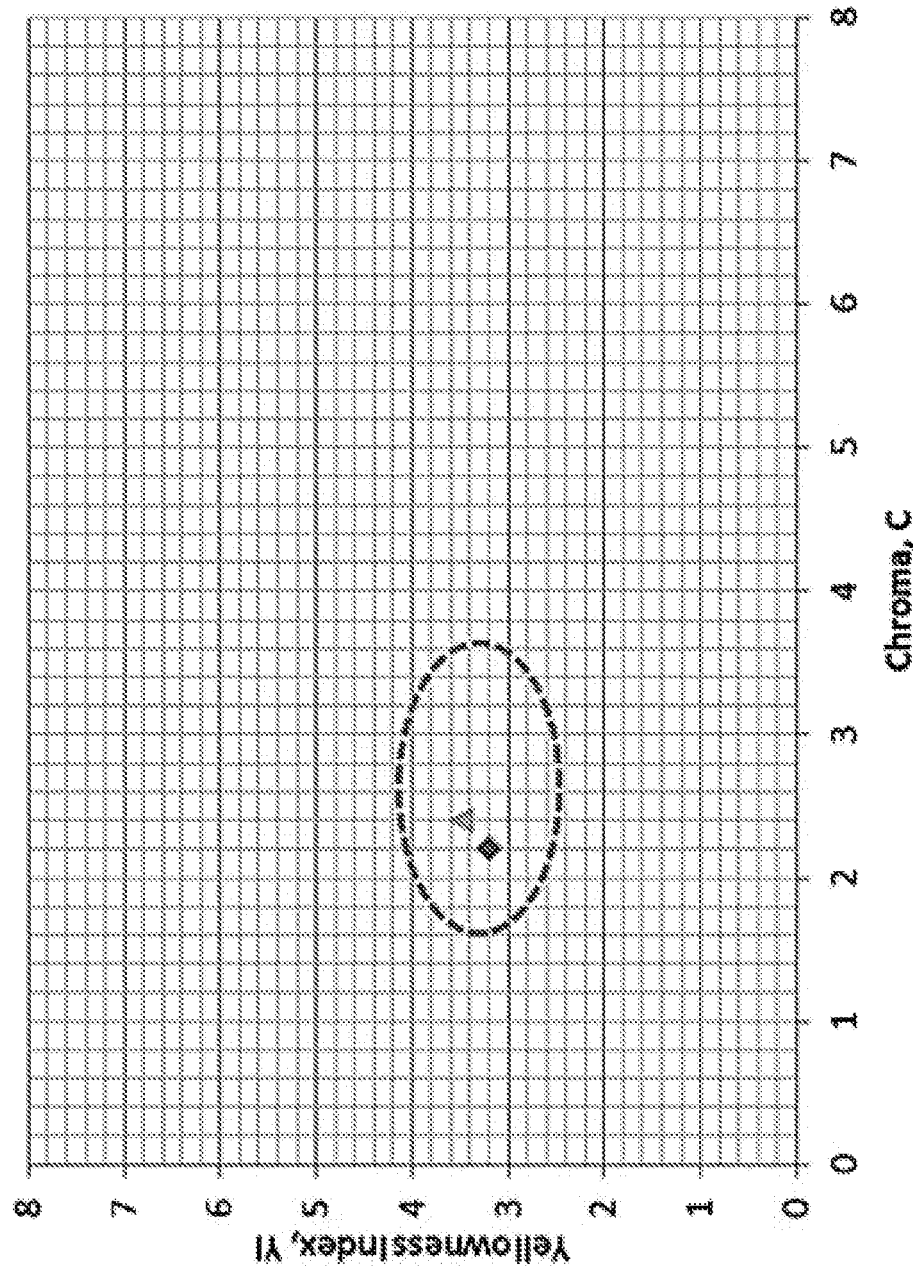


FIG. 13

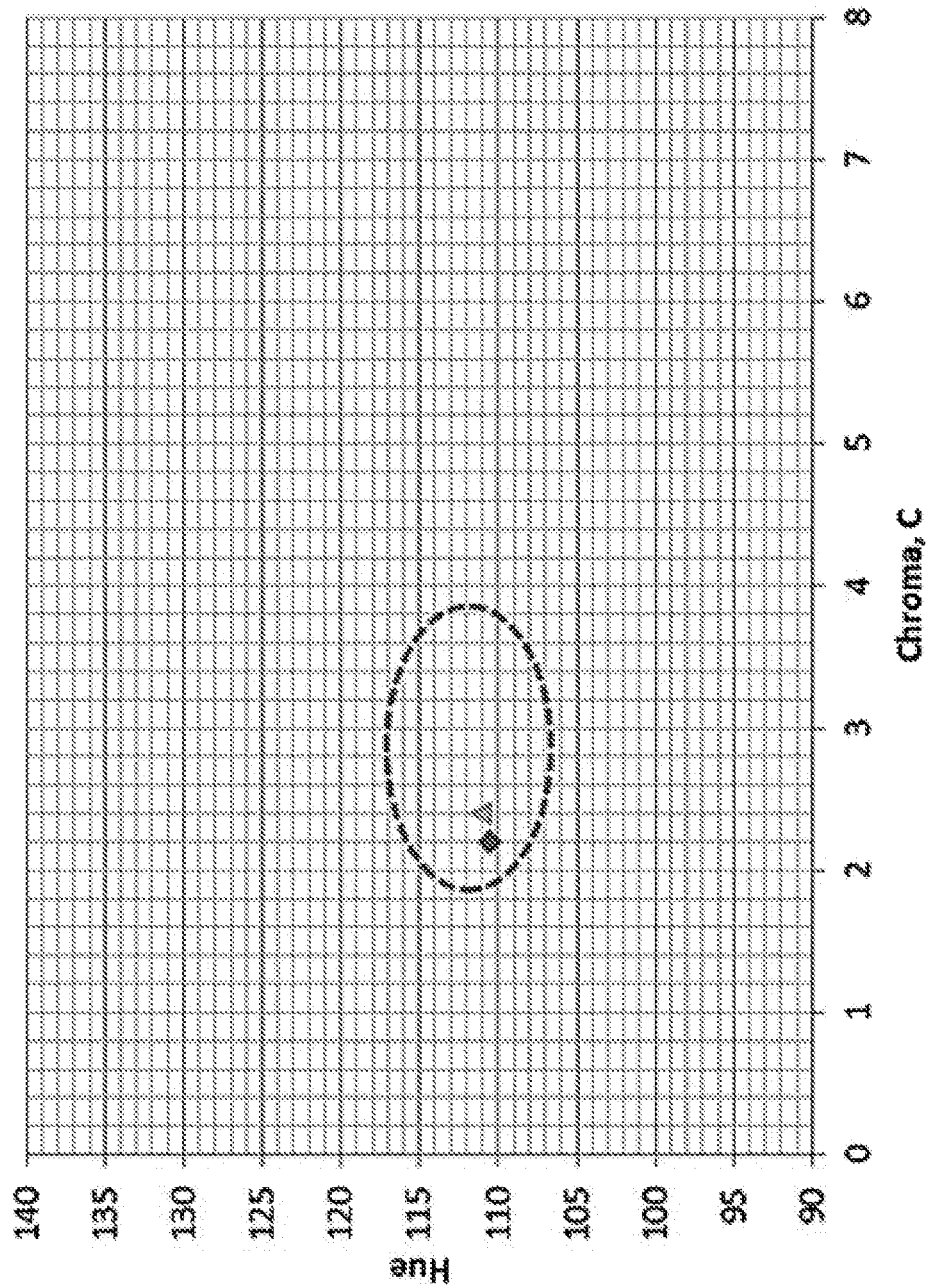


FIG. 14

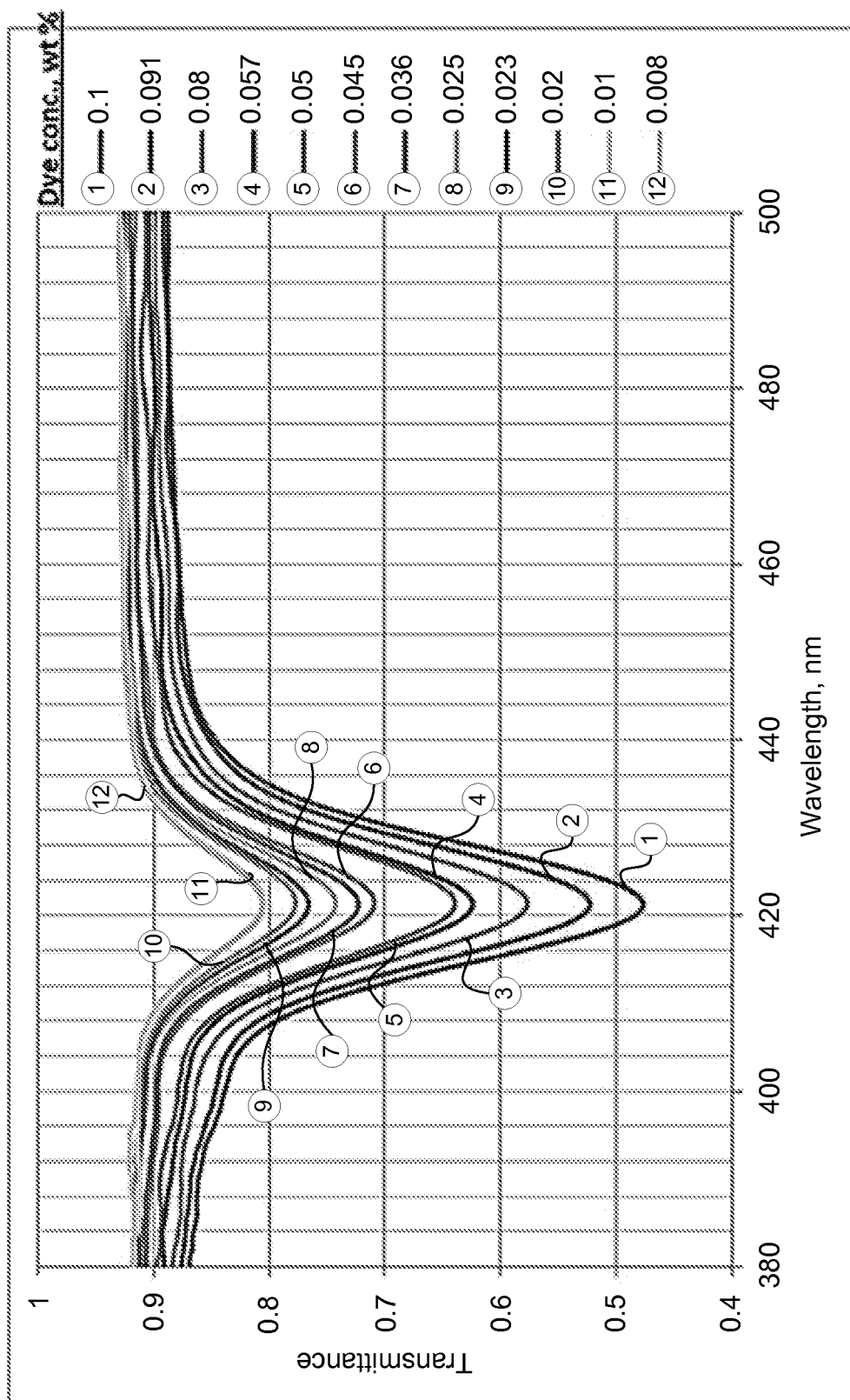


FIG. 15

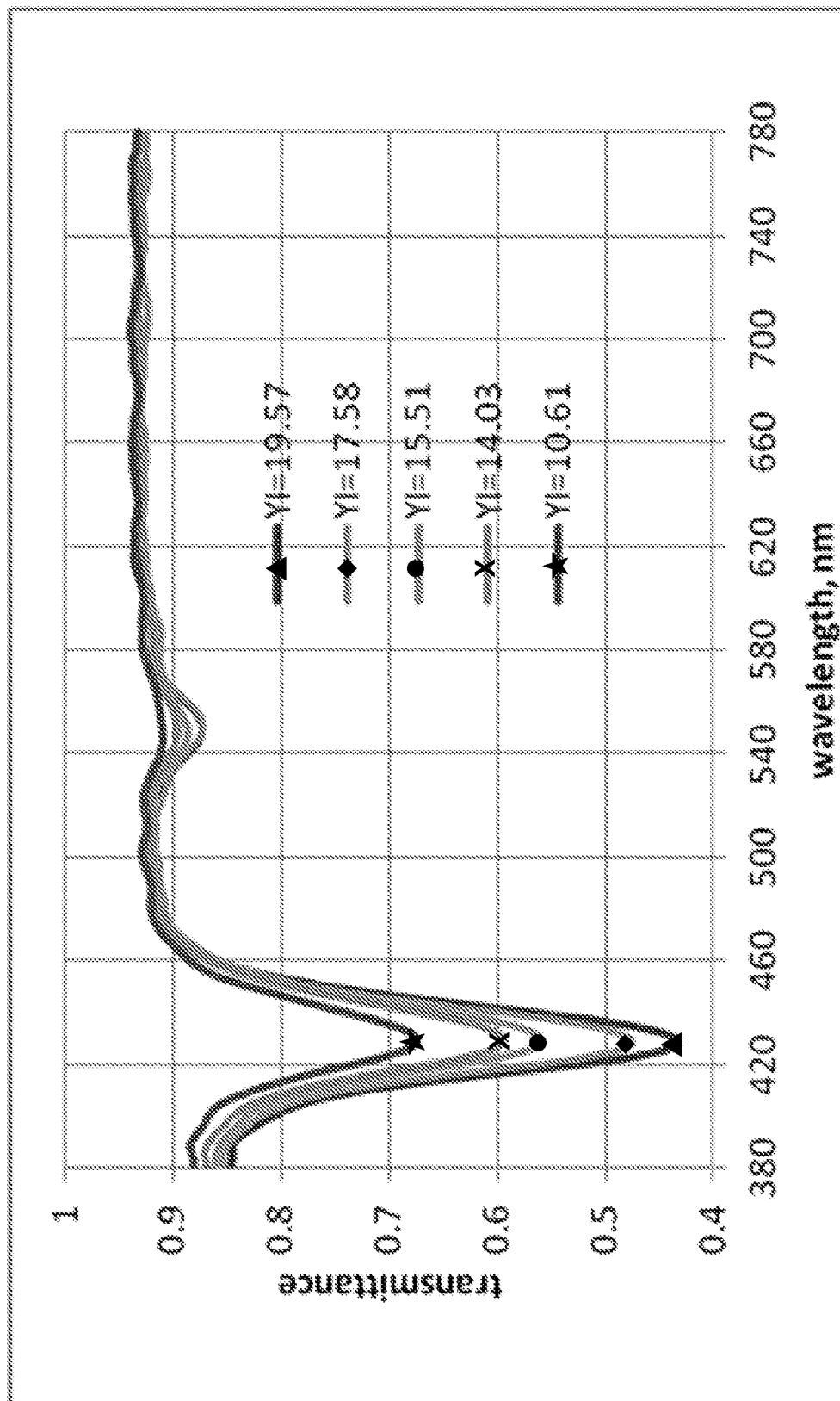


FIG. 16

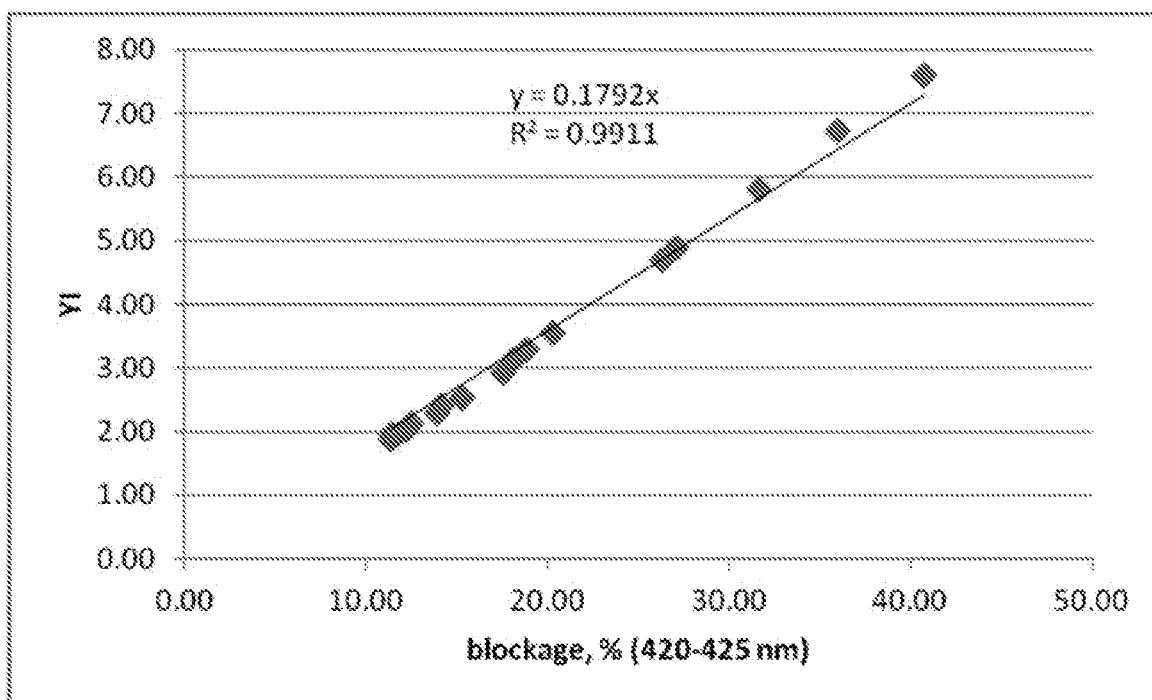


FIG. 17A

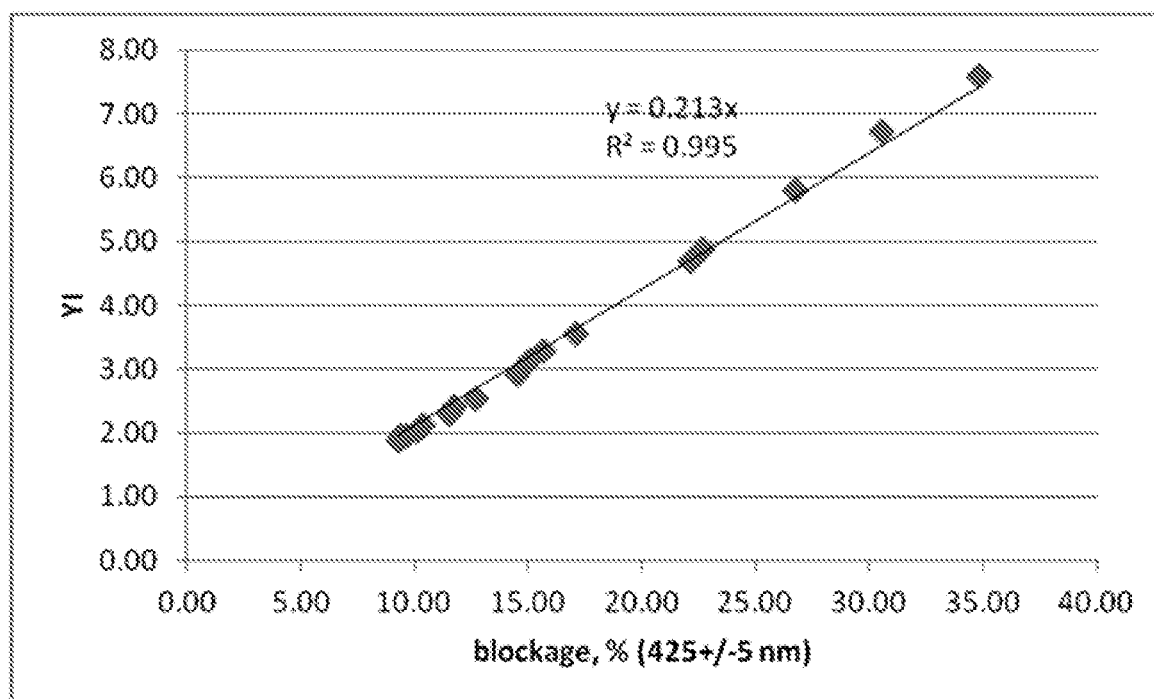


FIG. 17B

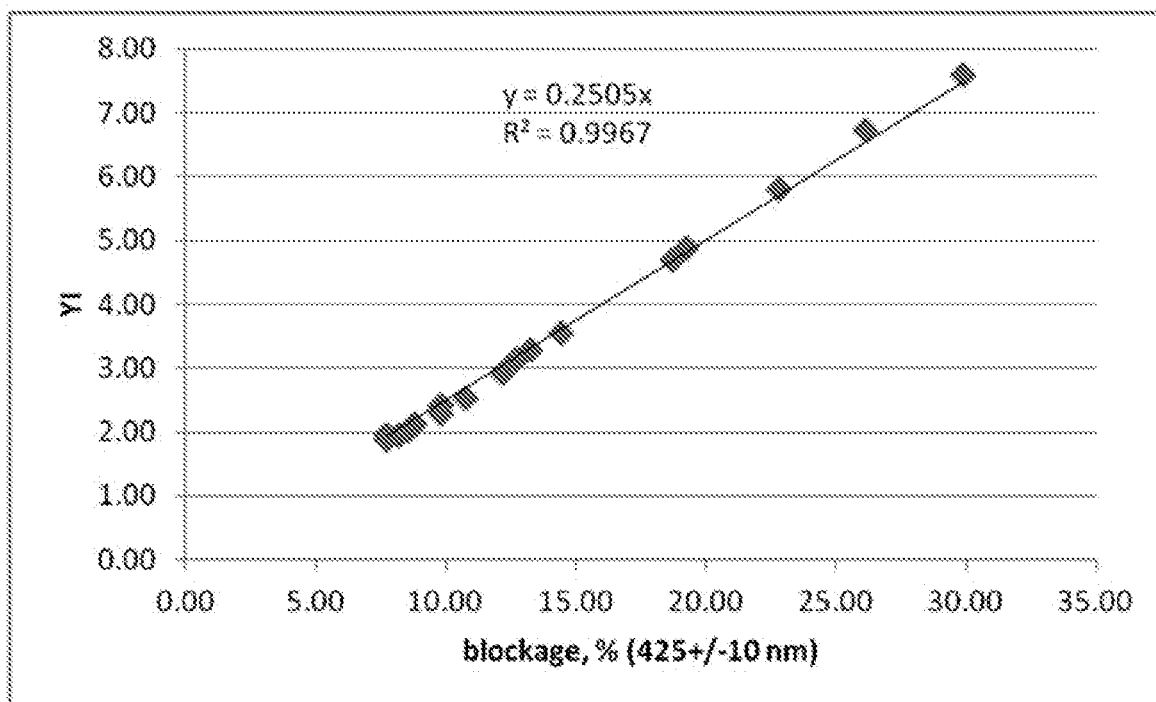


FIG. 17C

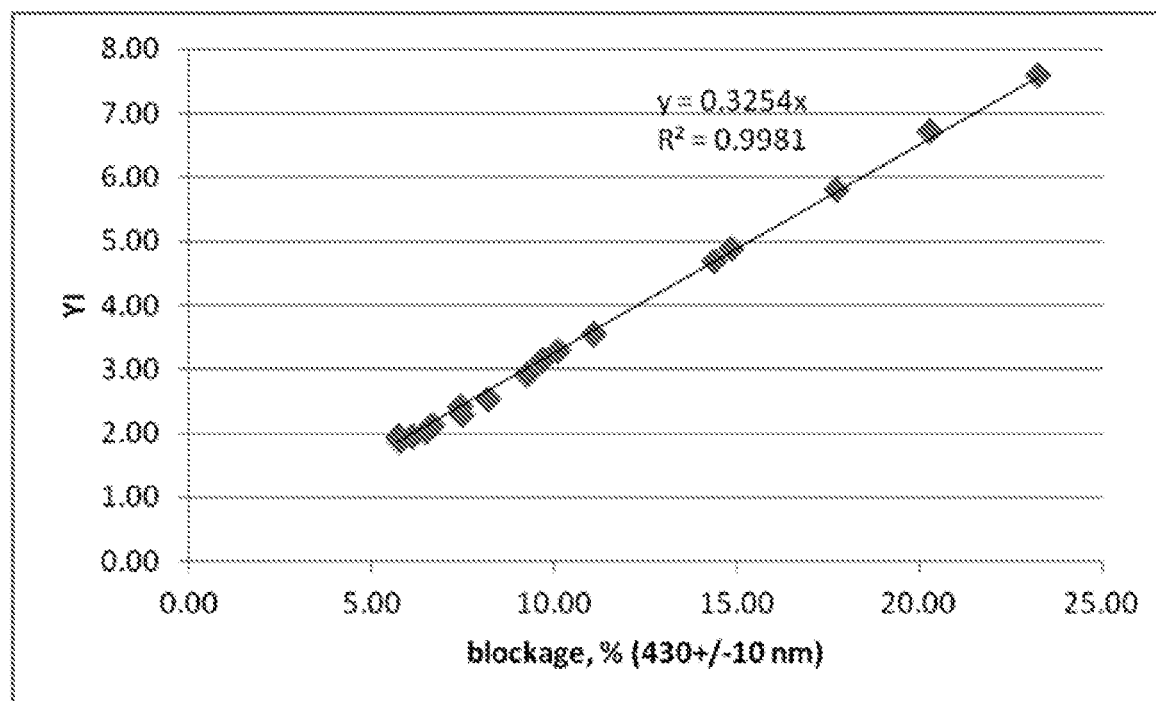


FIG. 17D

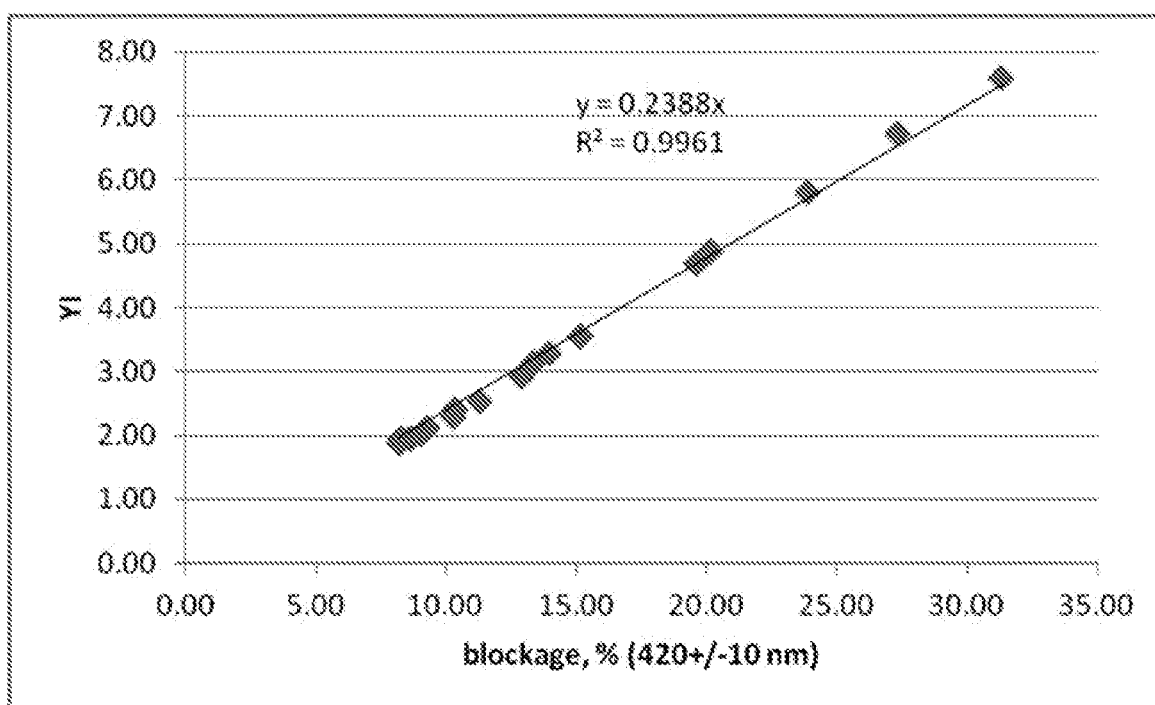


FIG. 17E

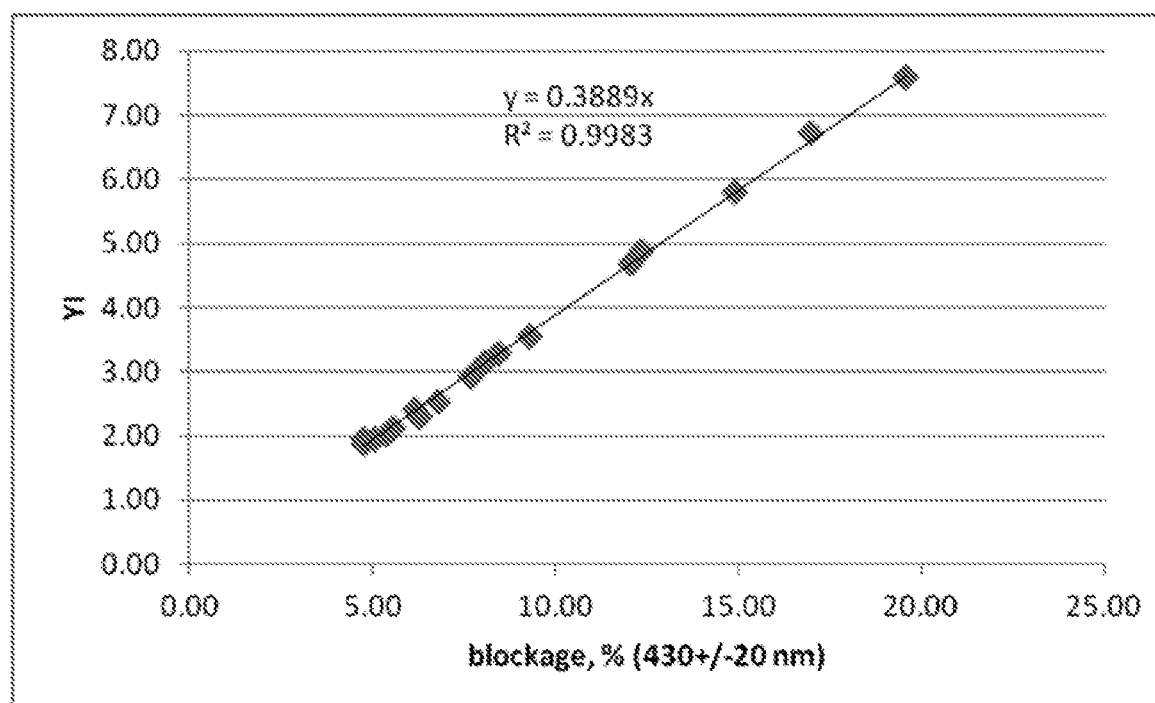


FIG. 17F

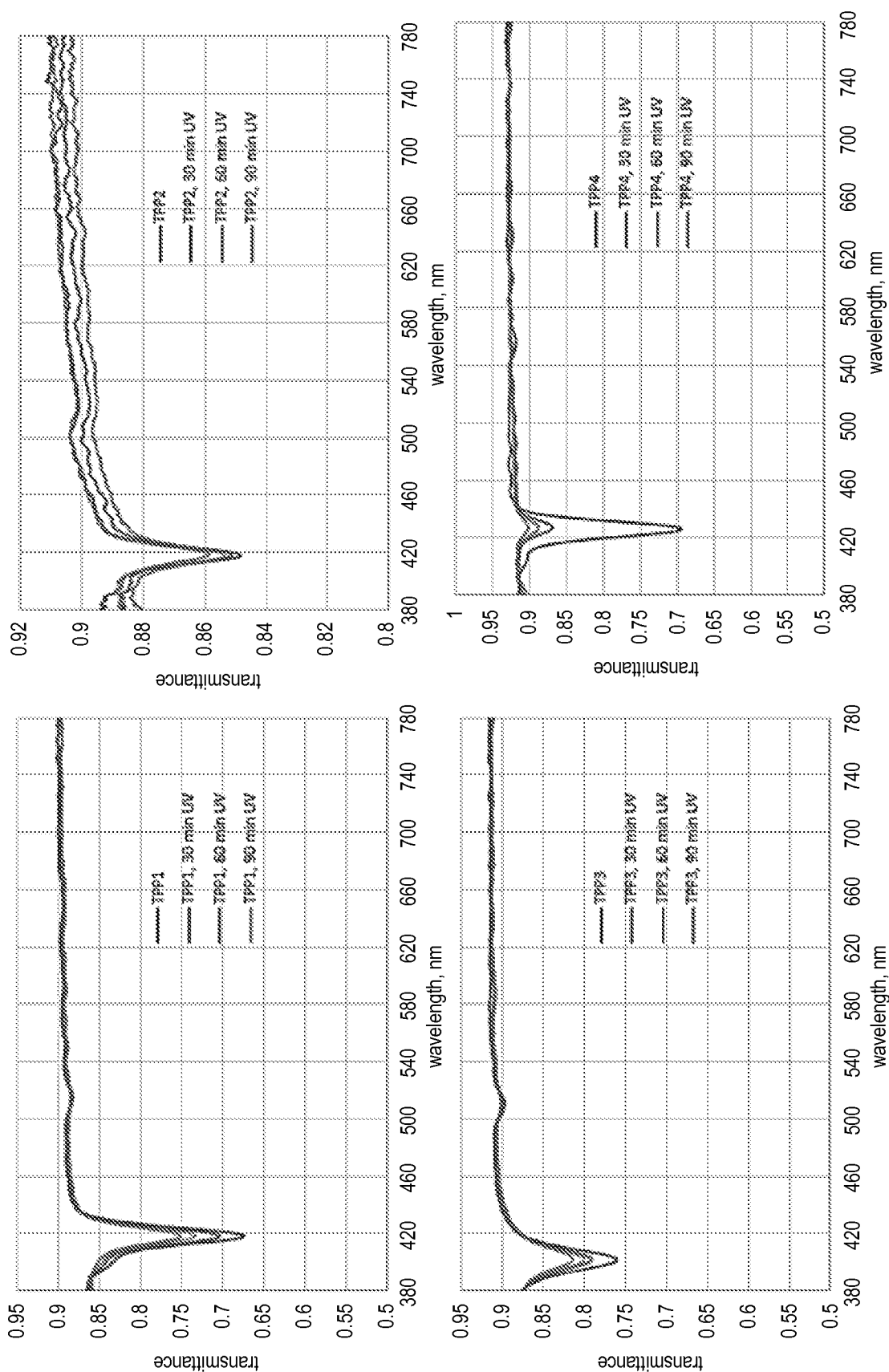


FIG. 18A

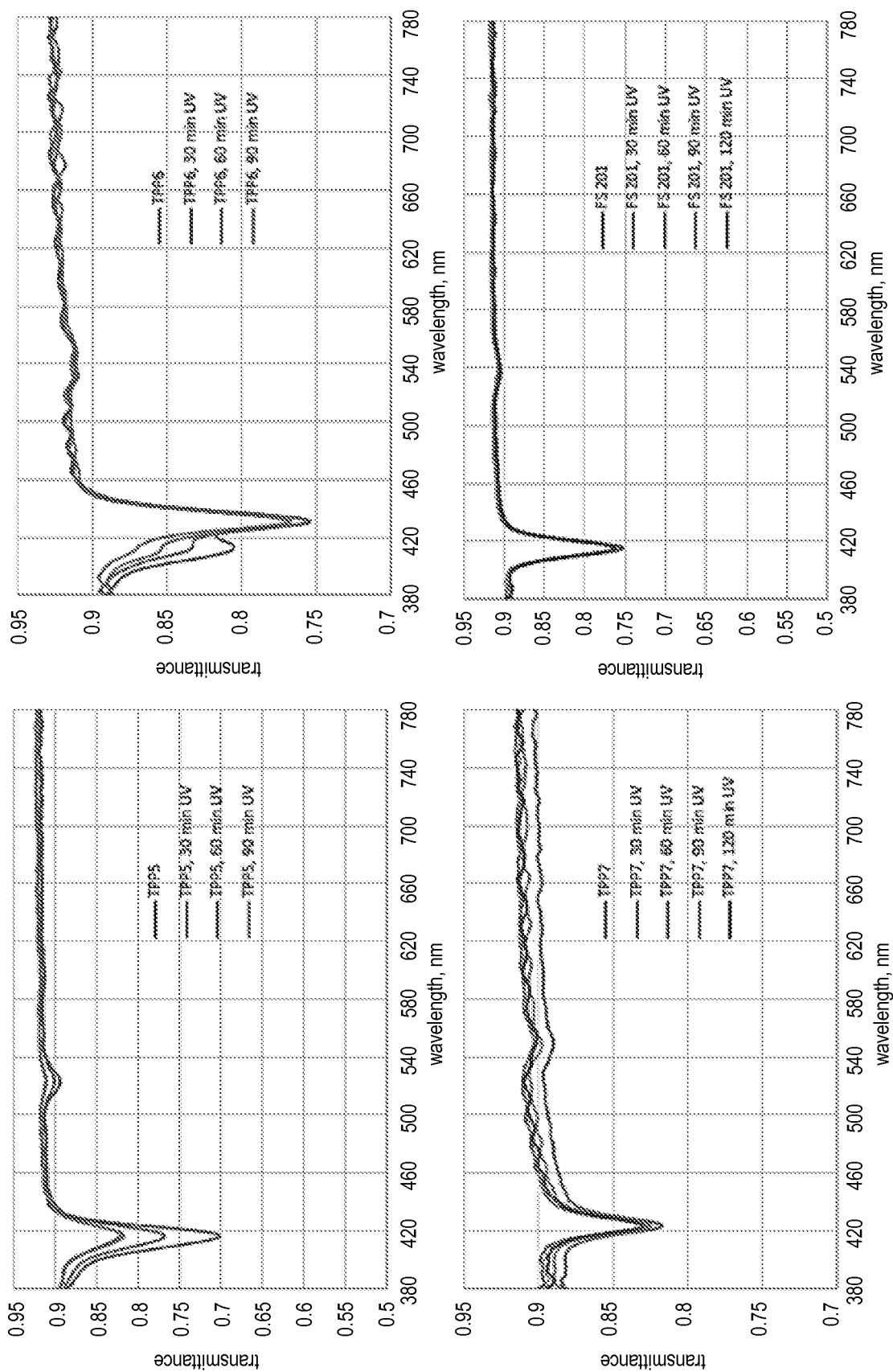


FIG. 18B

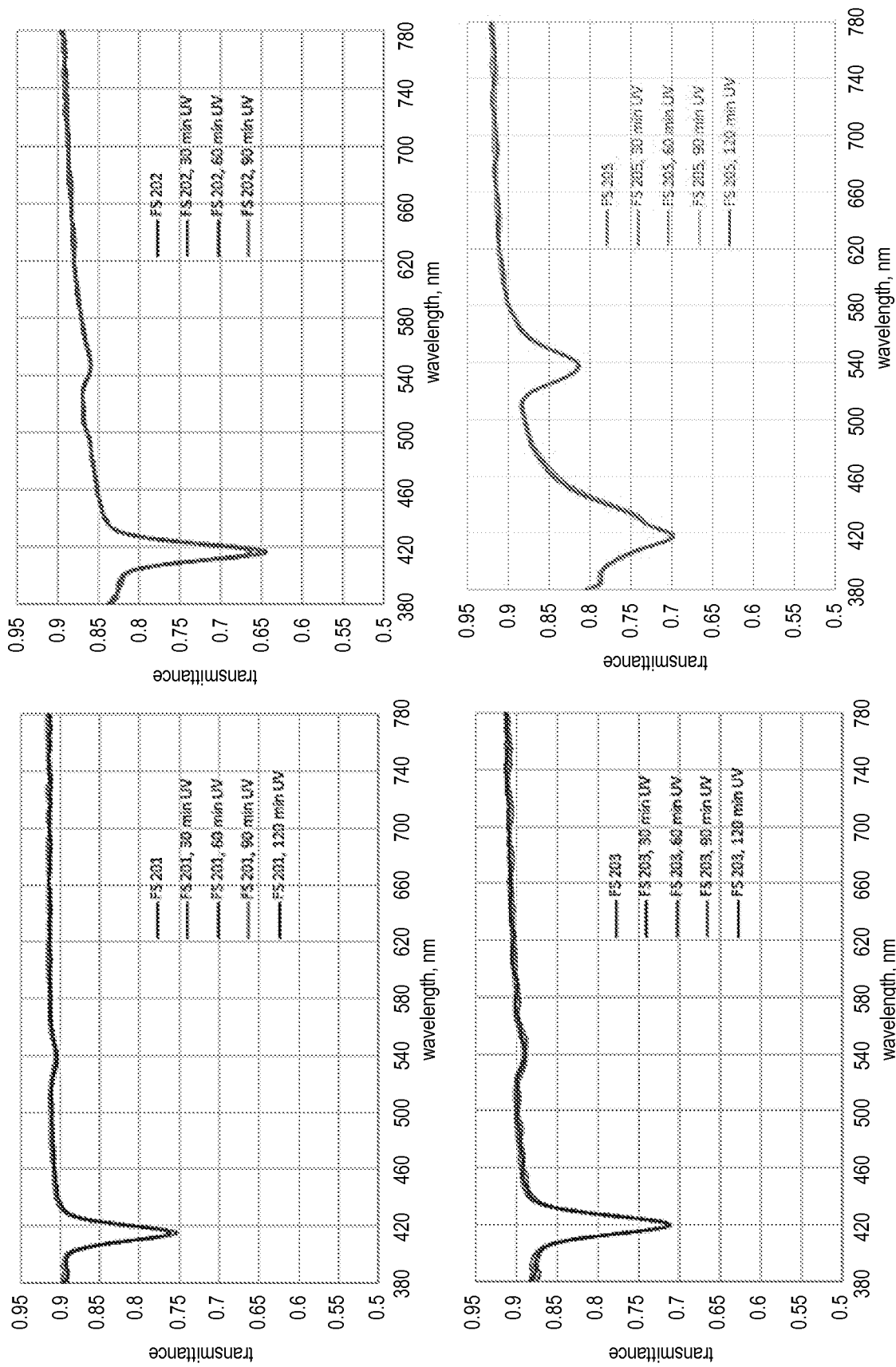


FIG. 19A

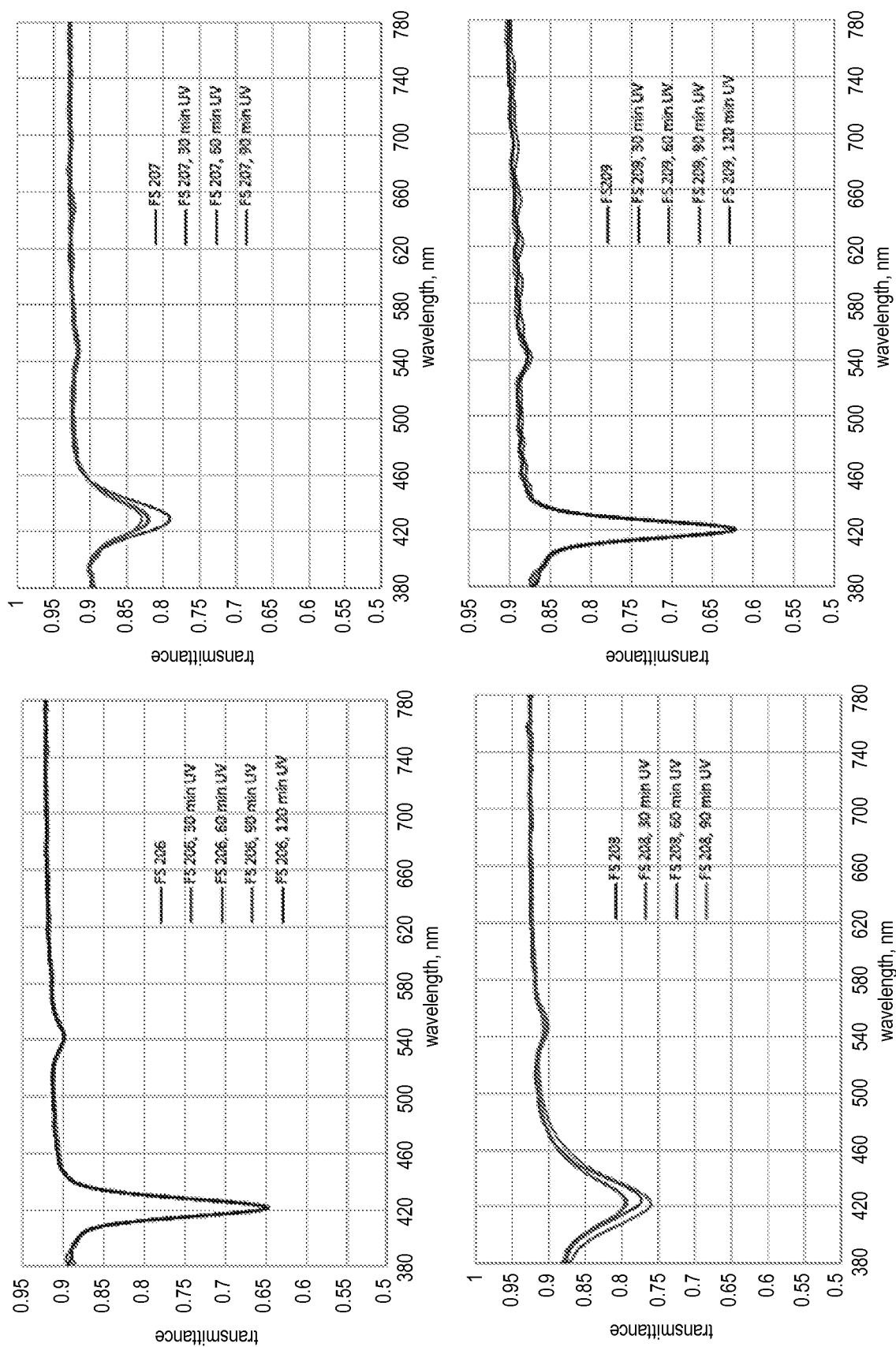


FIG. 19B

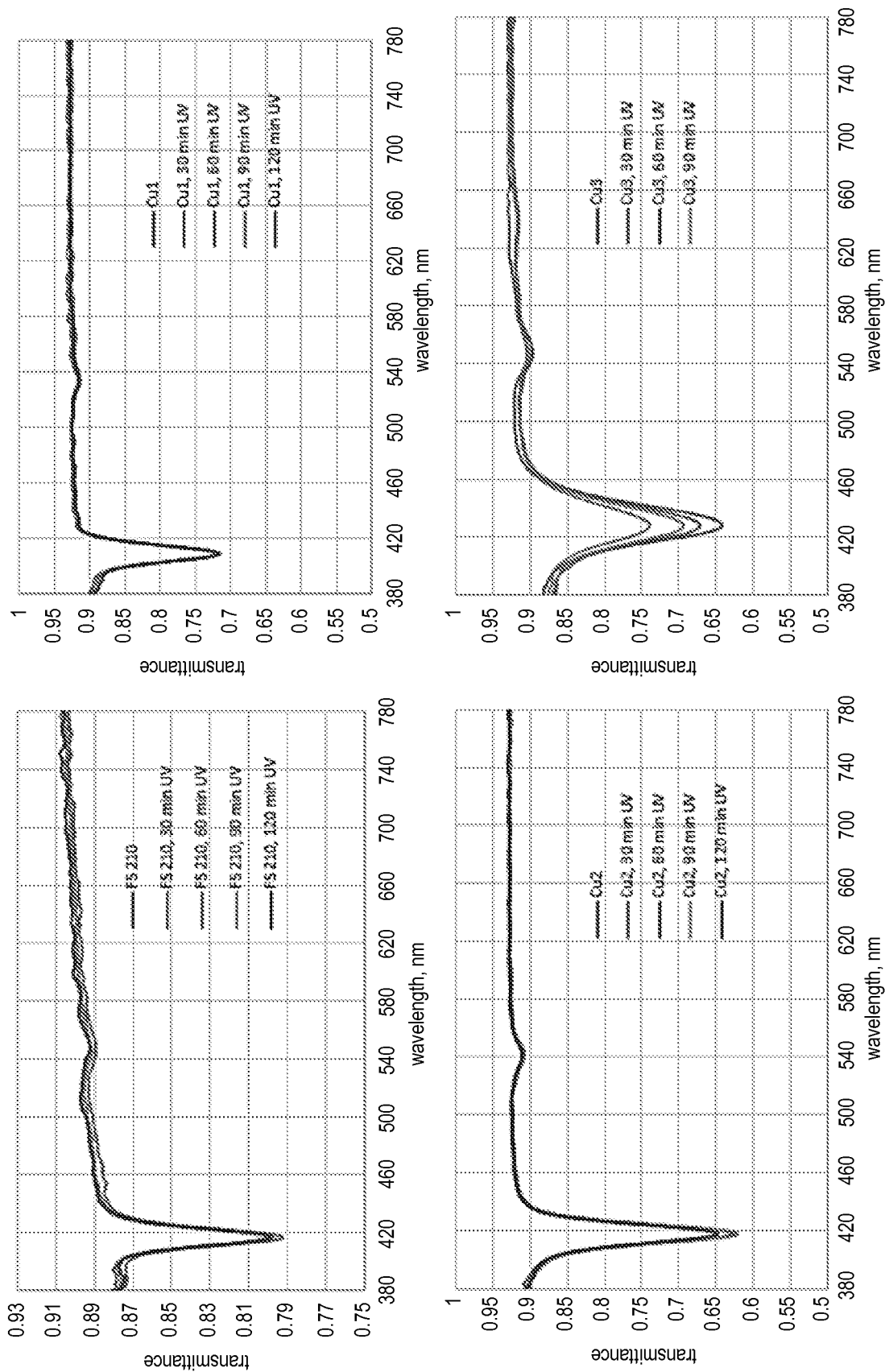


FIG. 19C

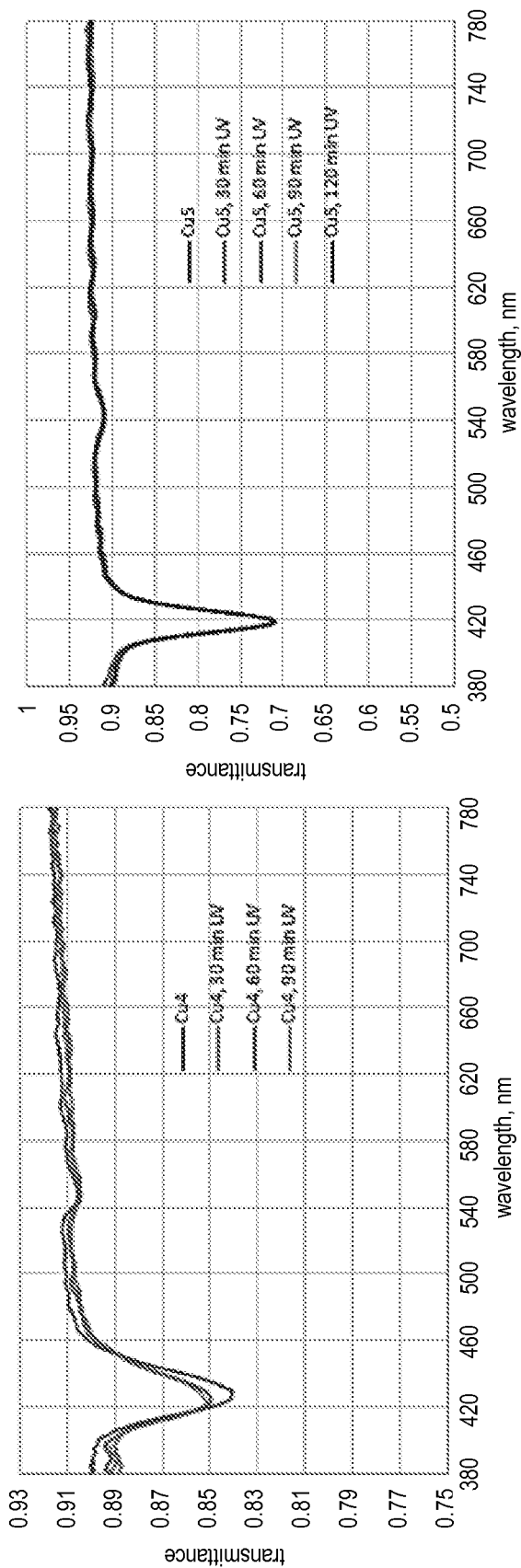


FIG. 19D

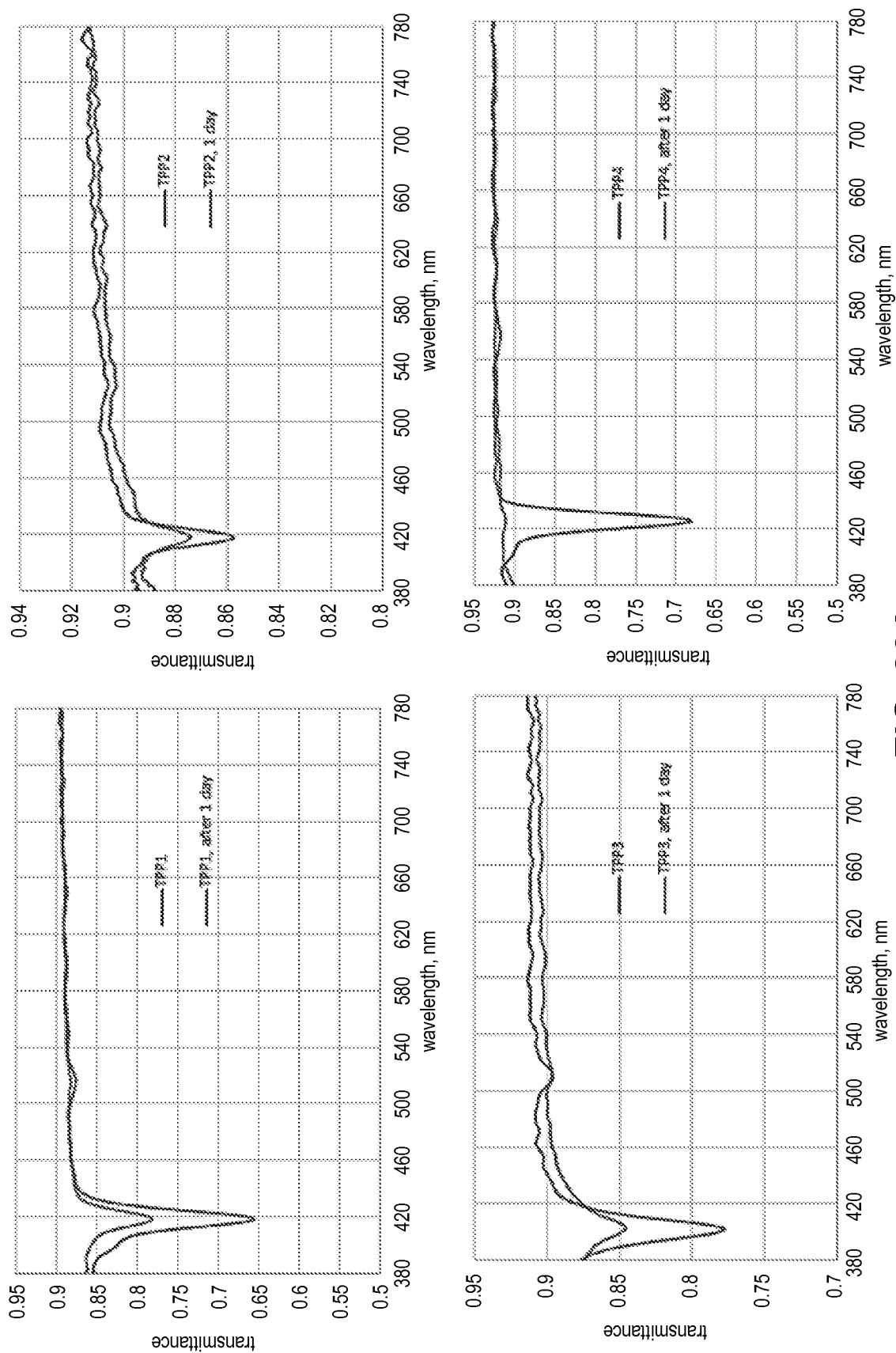


FIG. 20A

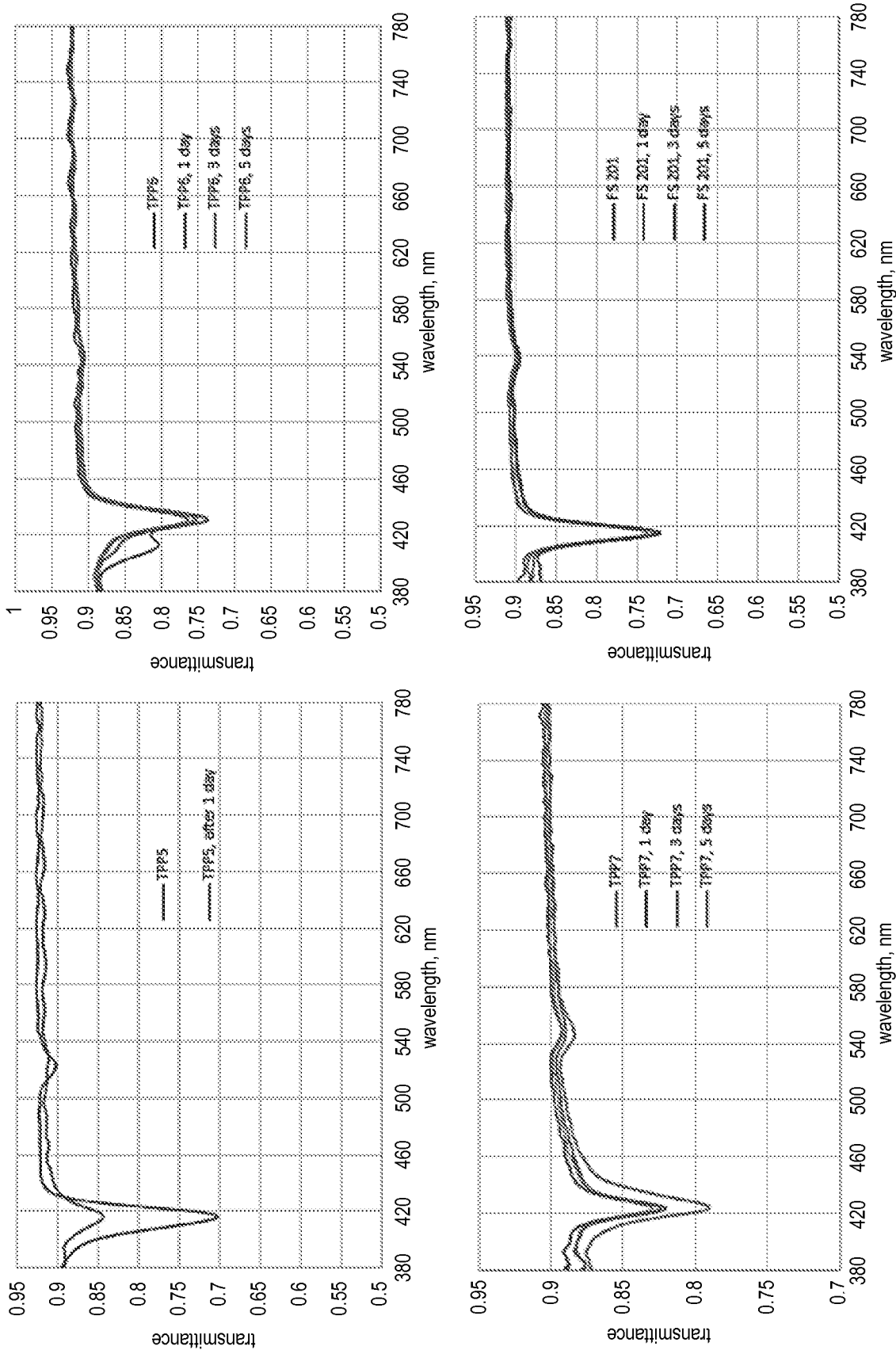


FIG. 20B

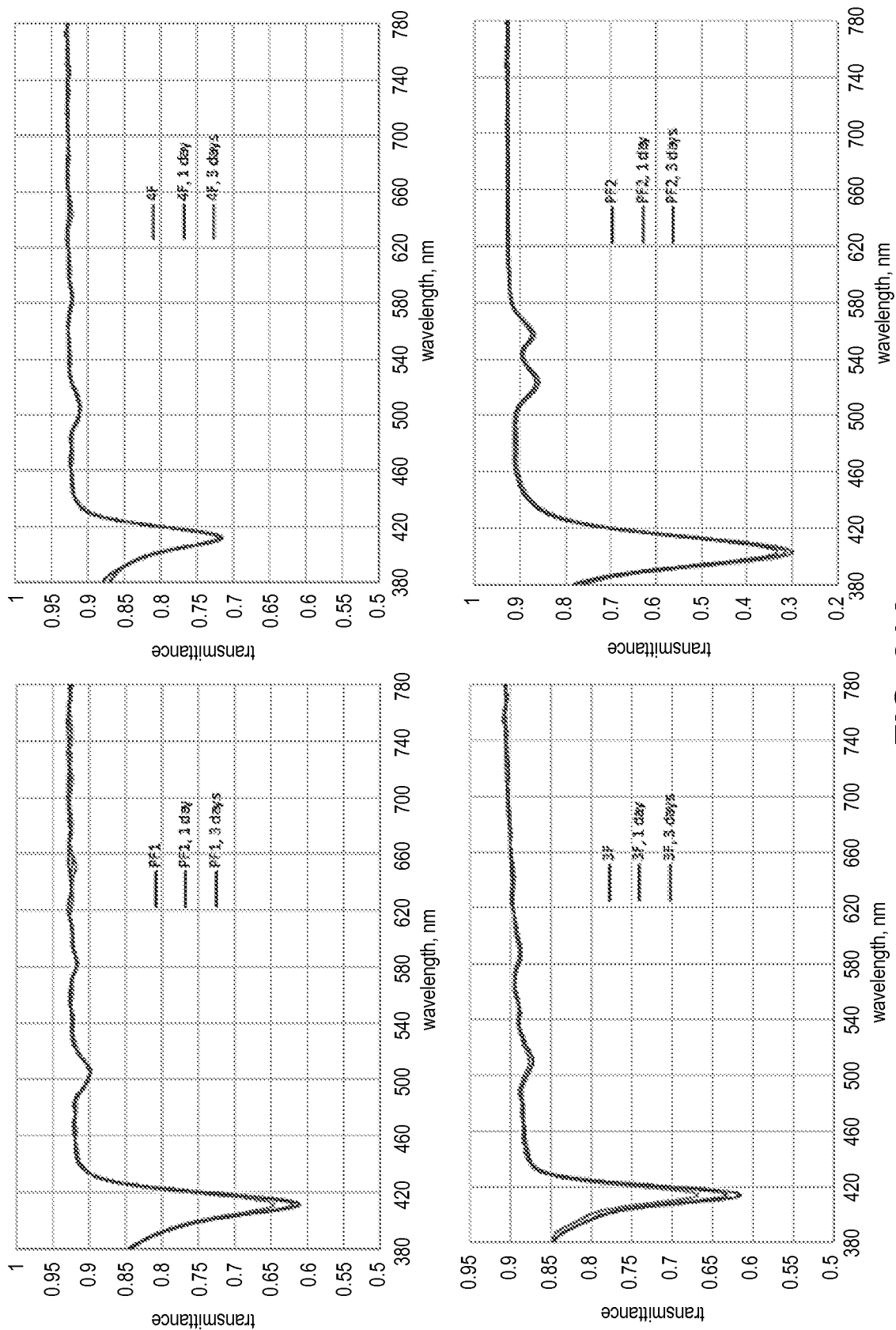


FIG. 21A

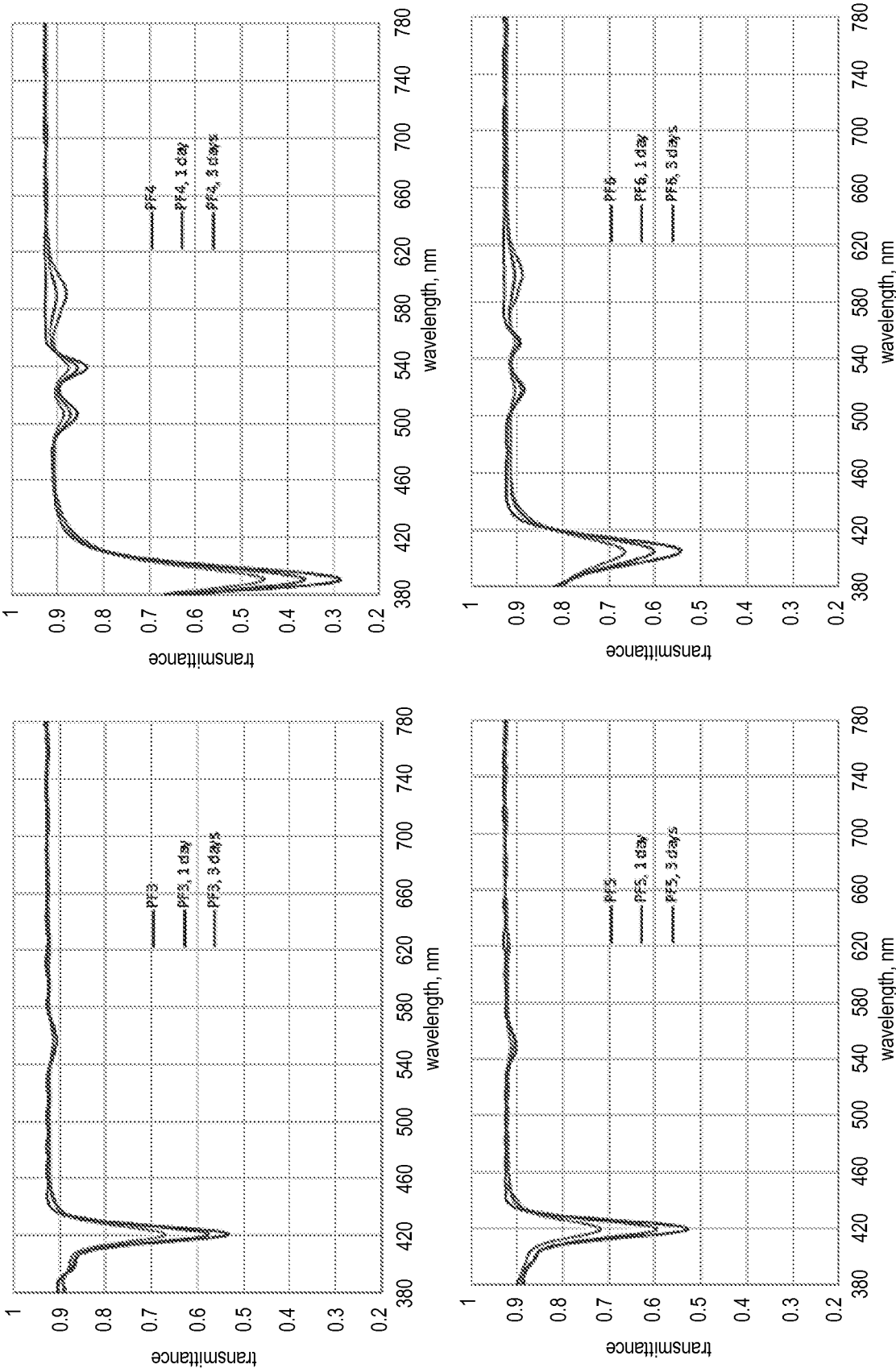


FIG. 21B

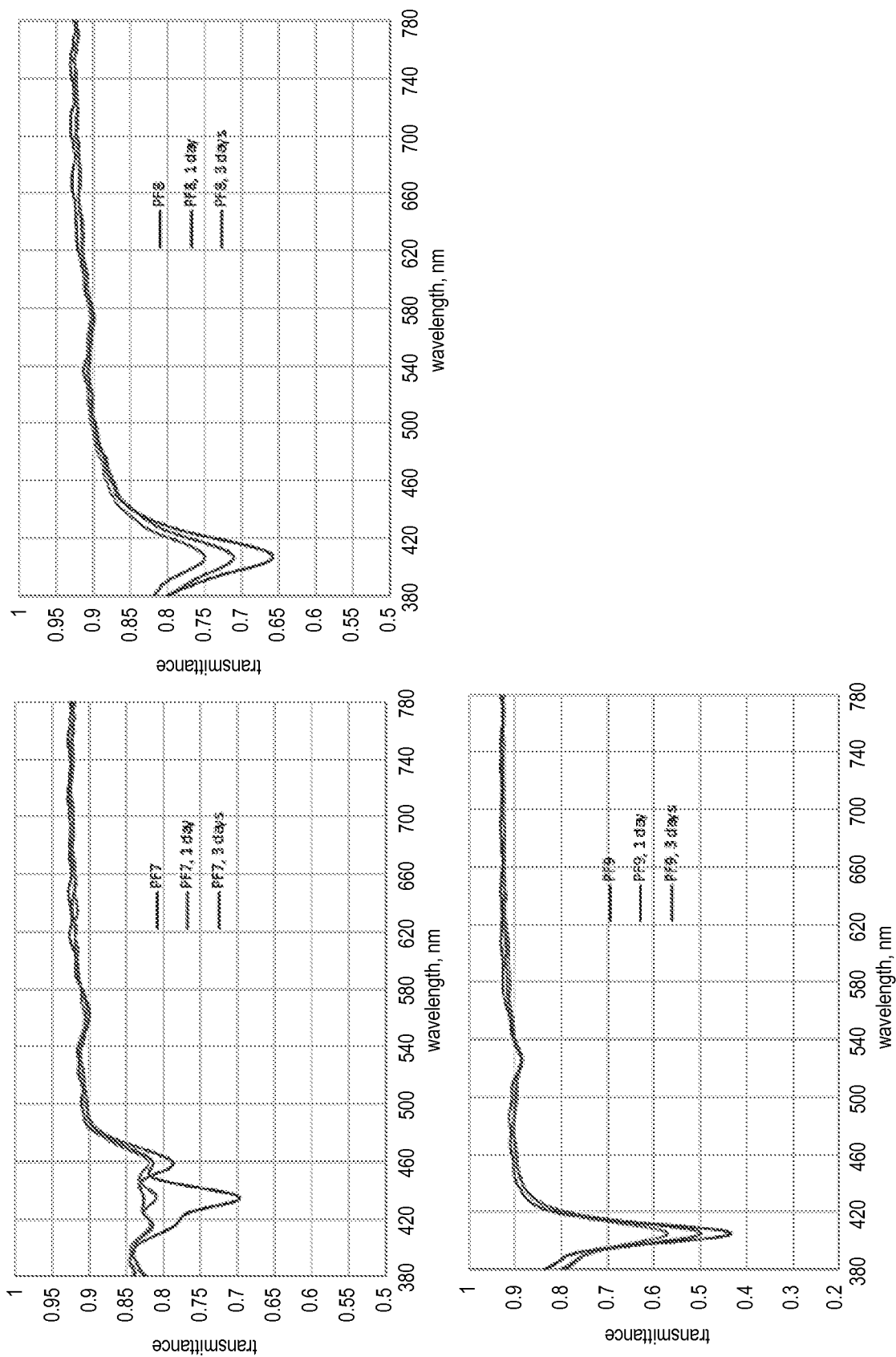


FIG. 21C

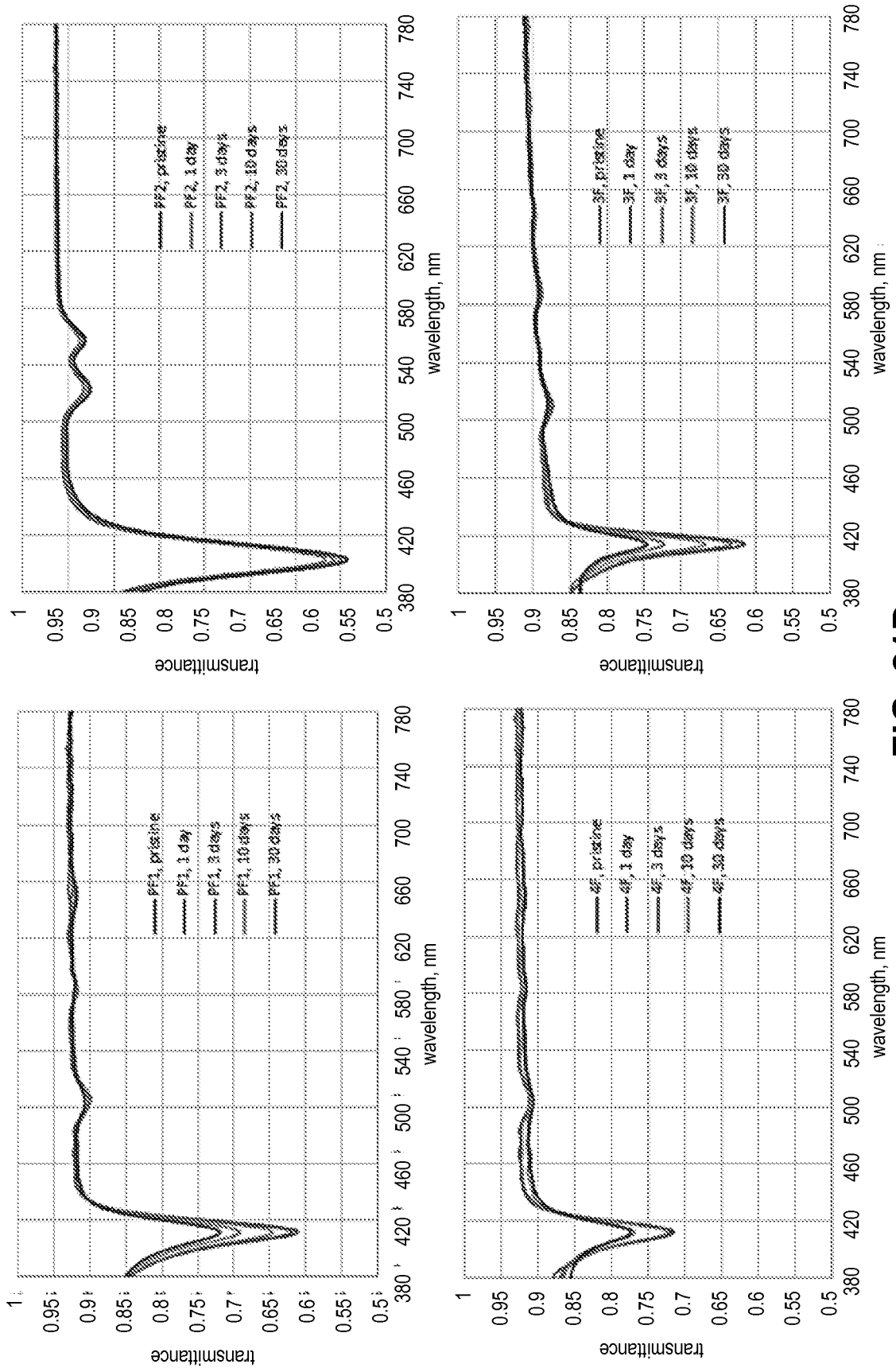


FIG. 21D

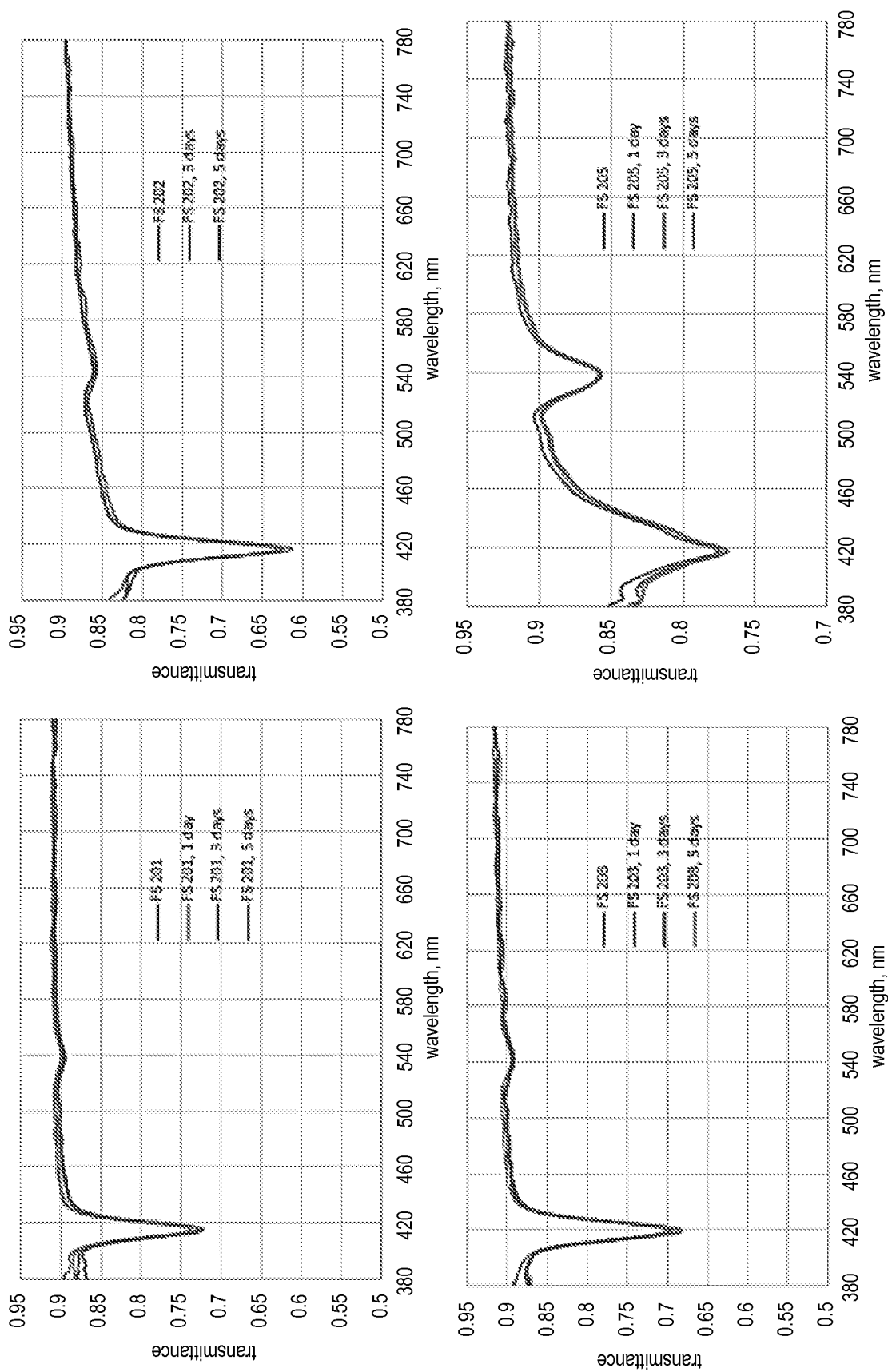


FIG. 22A

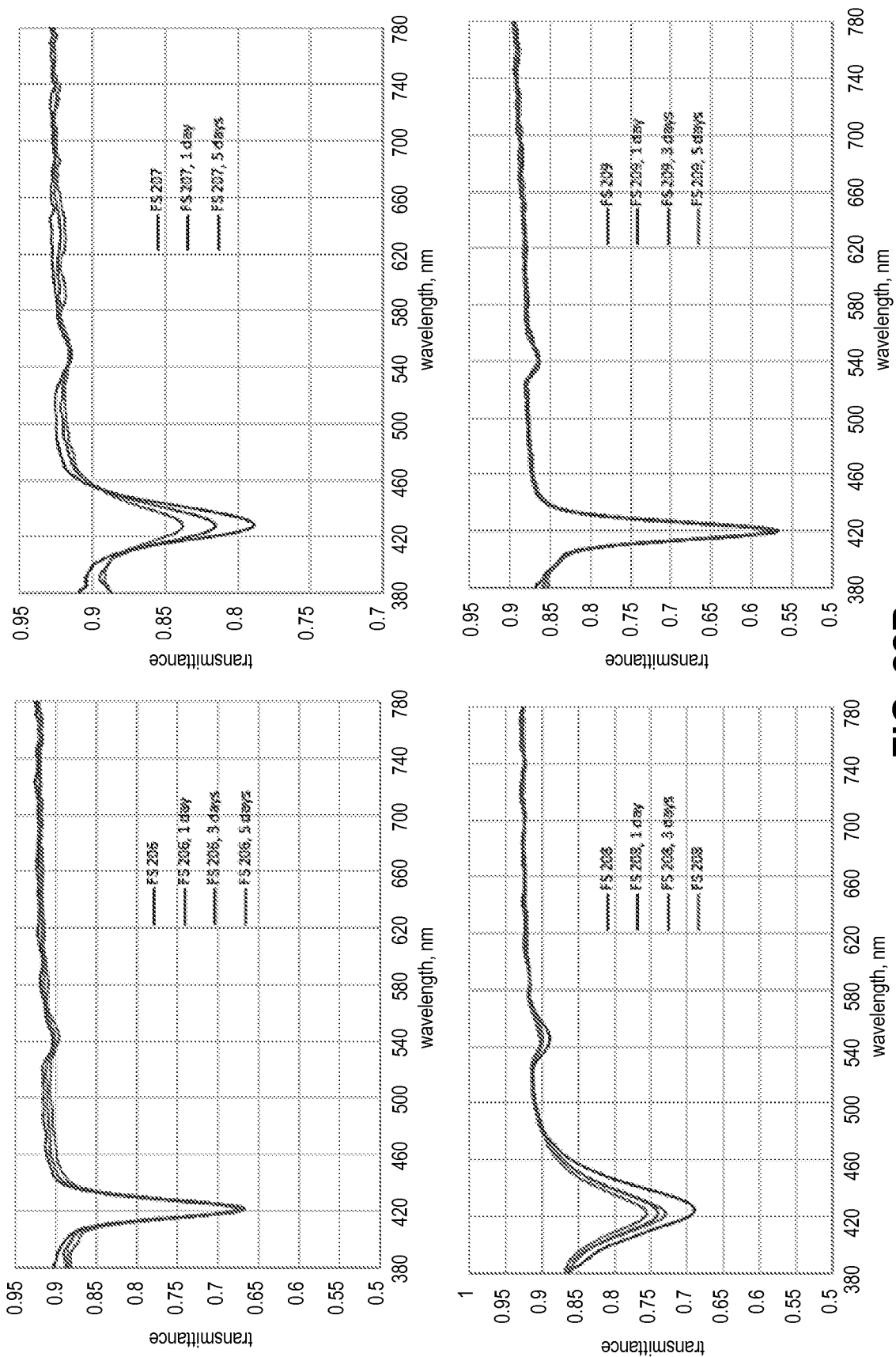


FIG. 22B

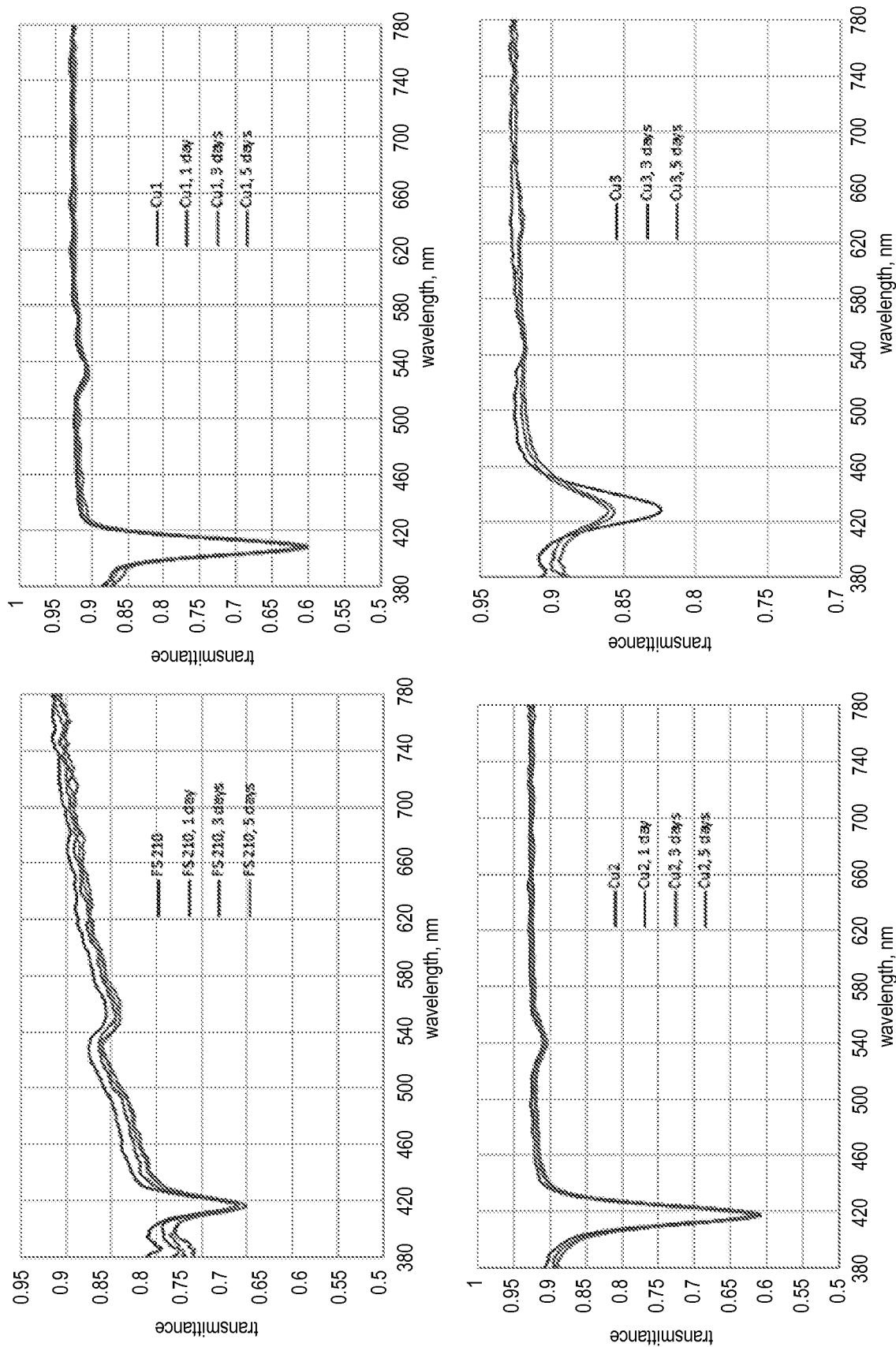


FIG. 22C

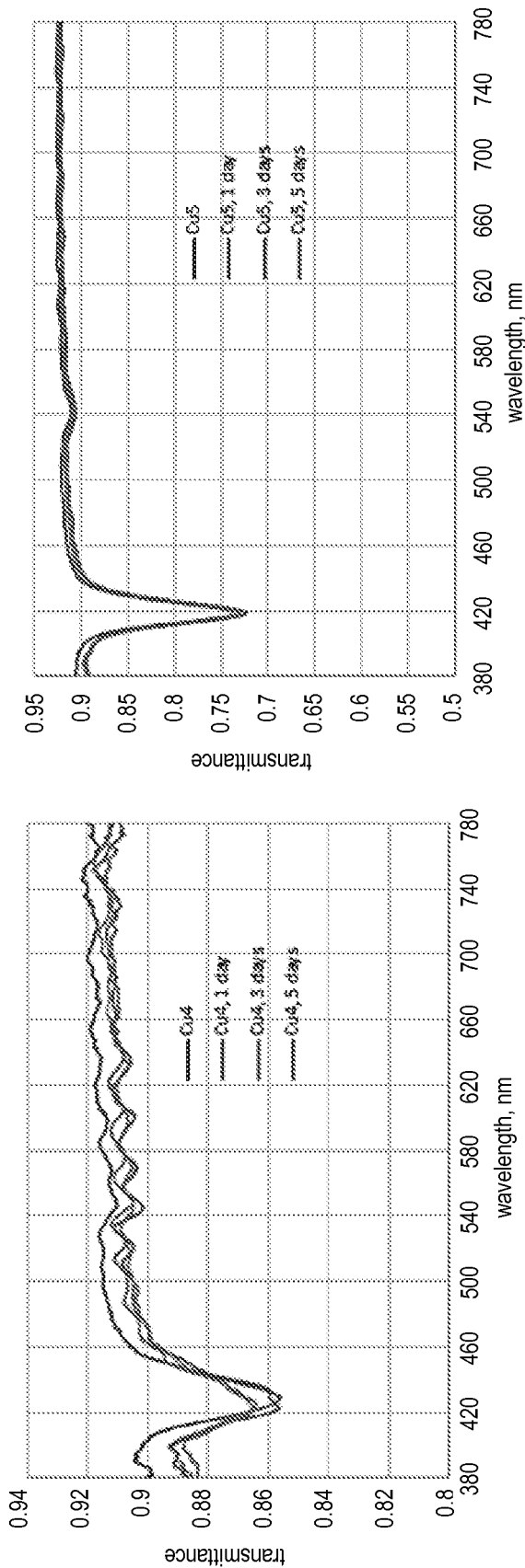


FIG. 22D

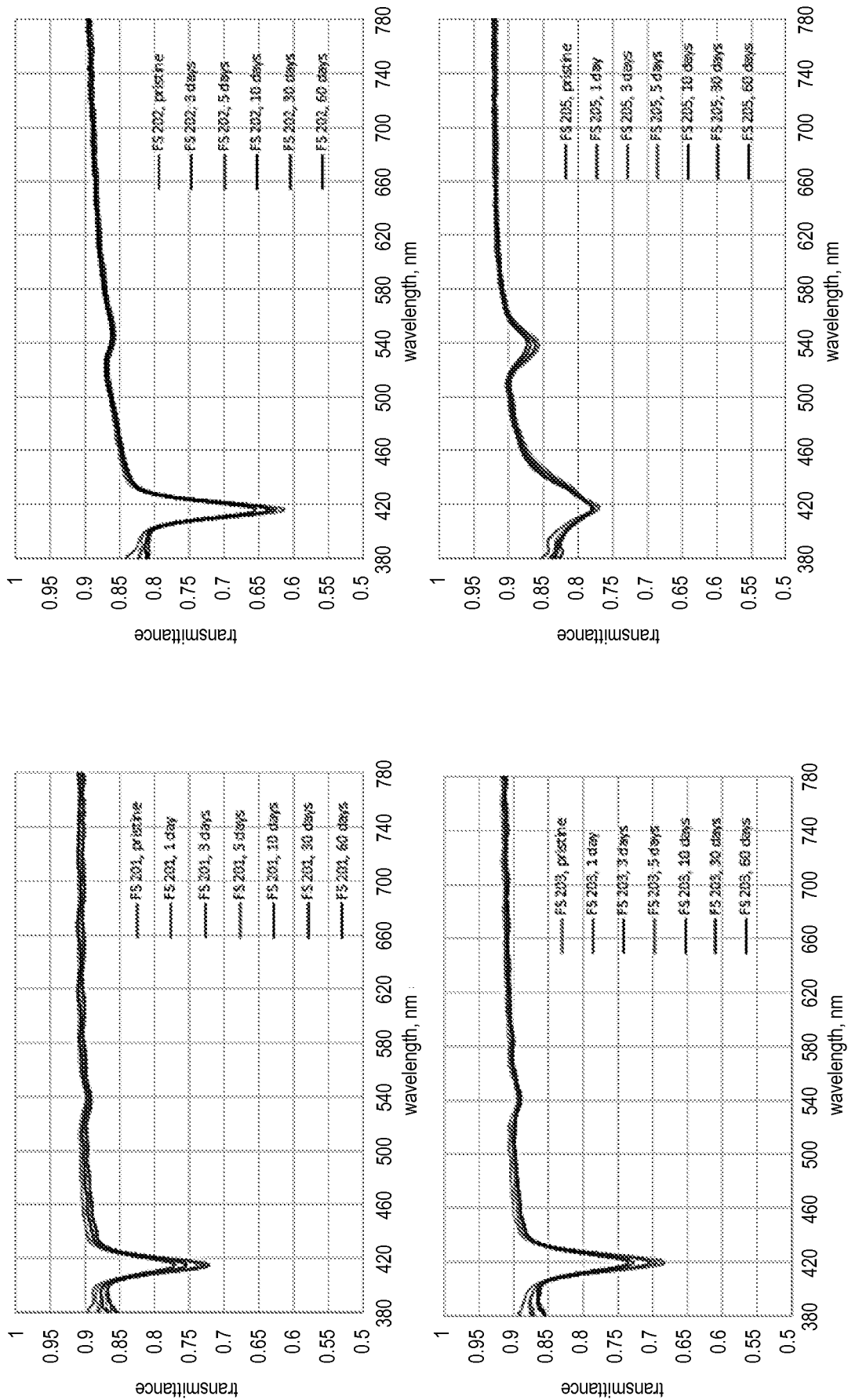


FIG. 22E

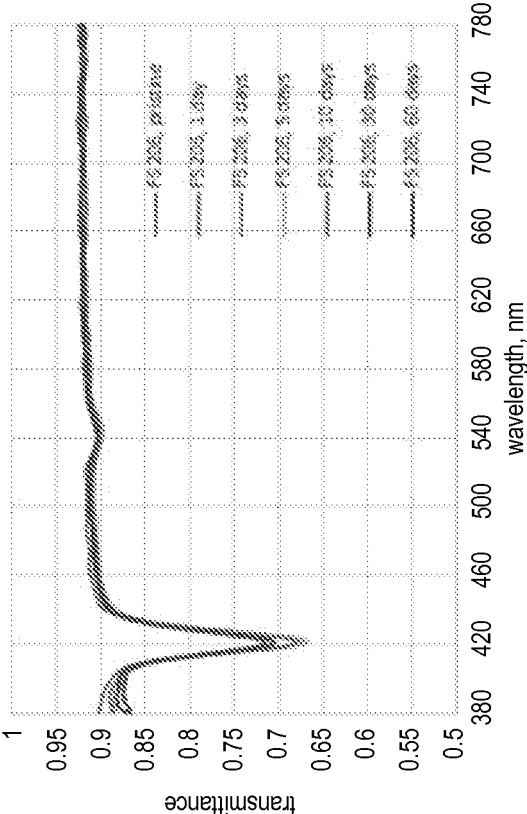
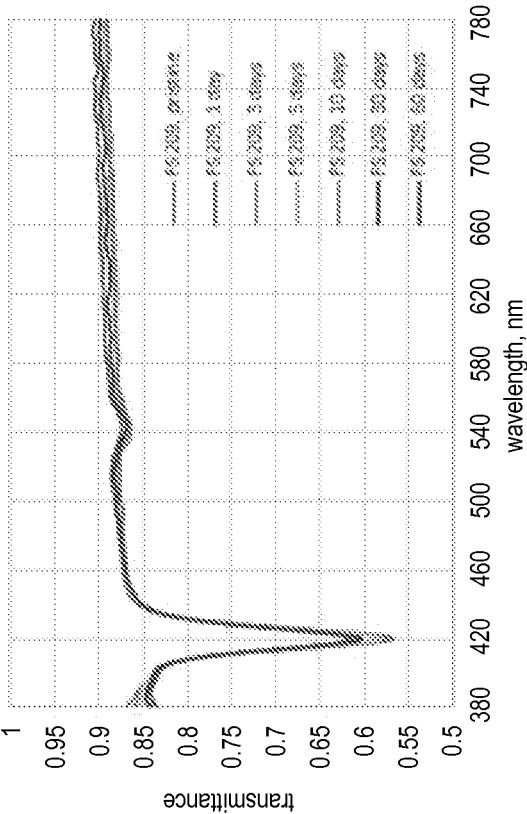


FIG. 22F

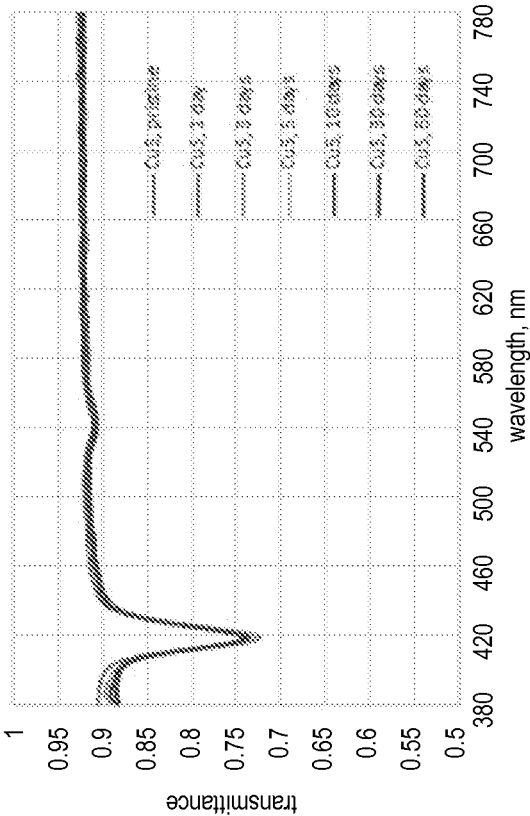
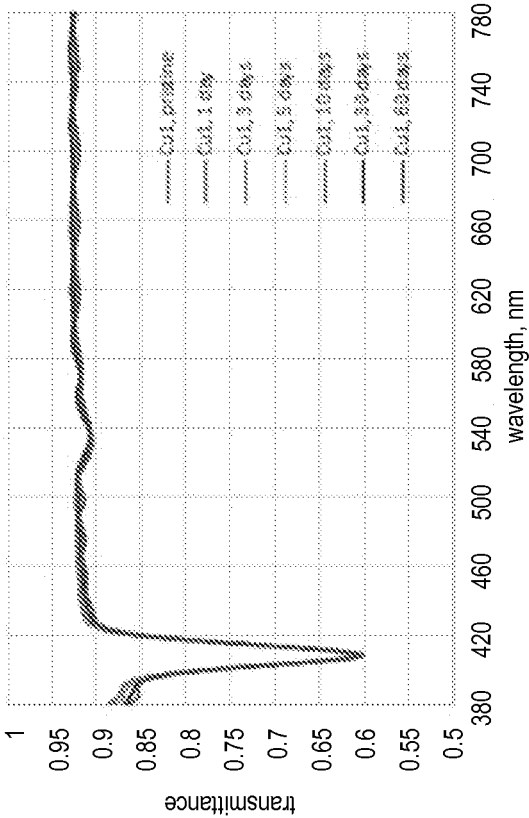
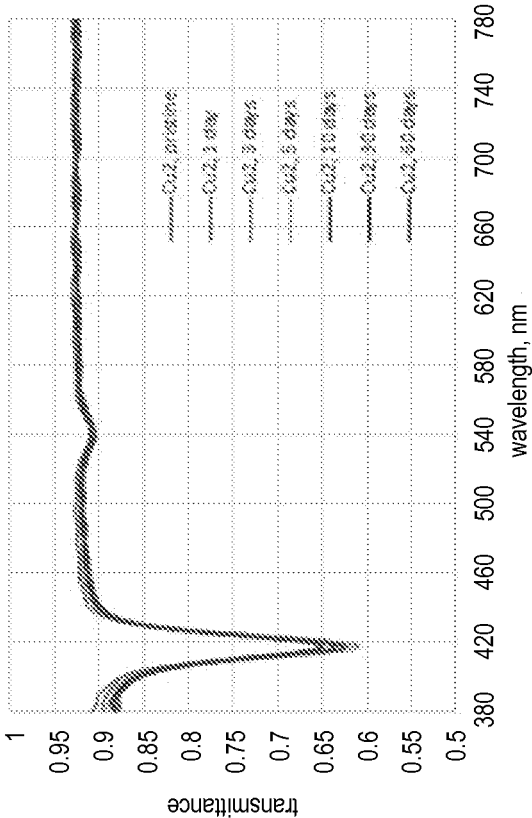


FIG. 22G

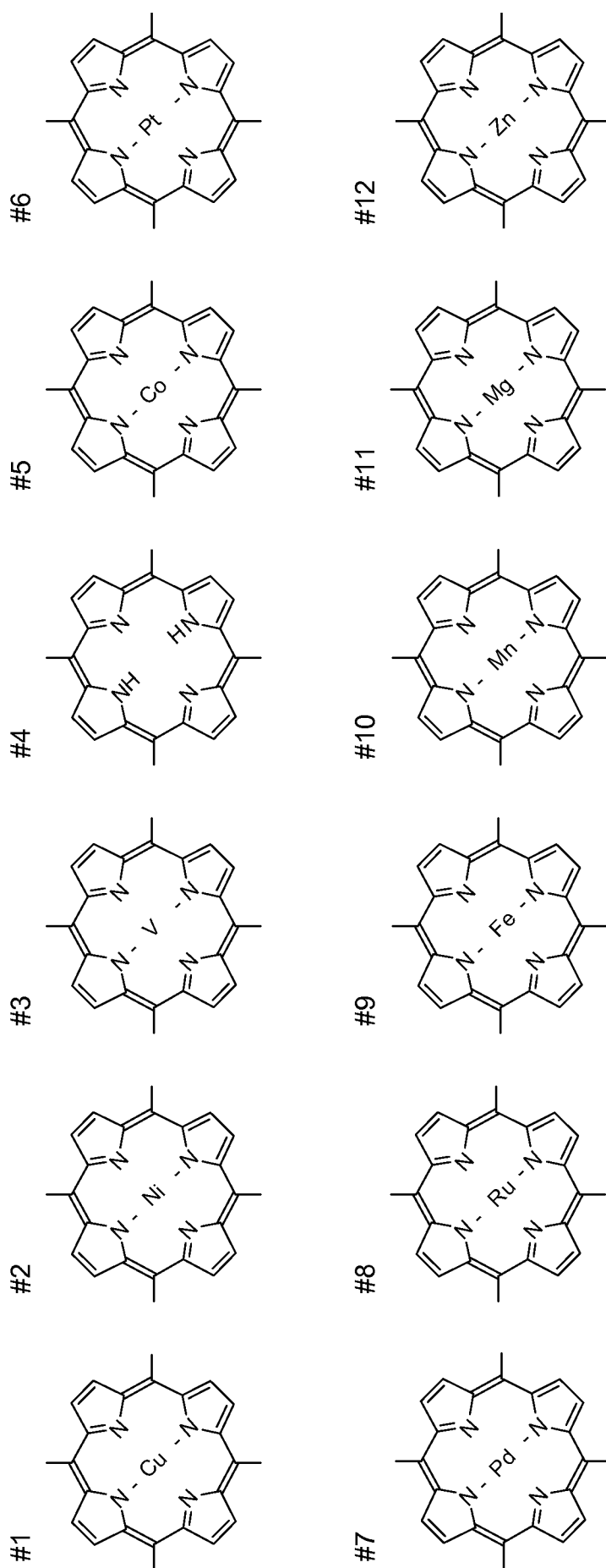


FIG. 23

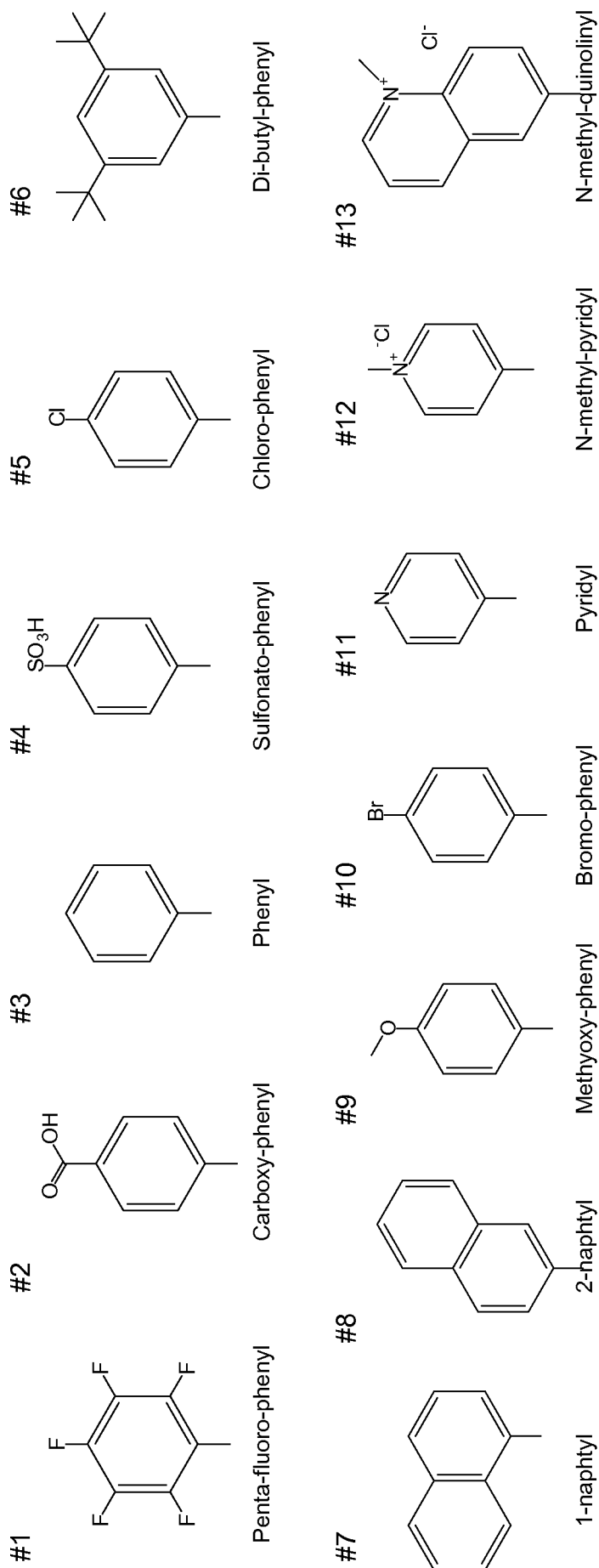
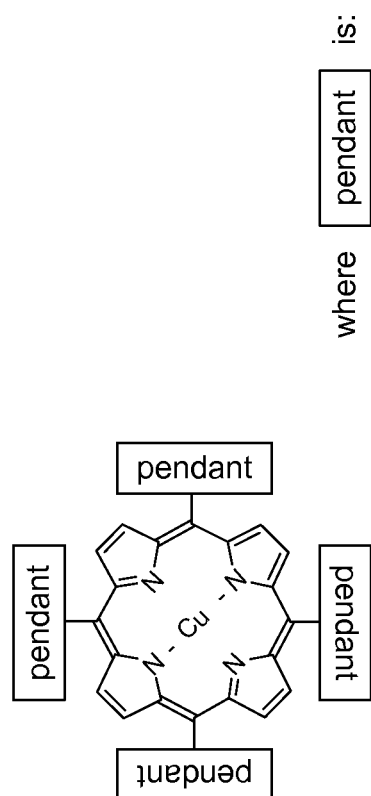


FIG. 24

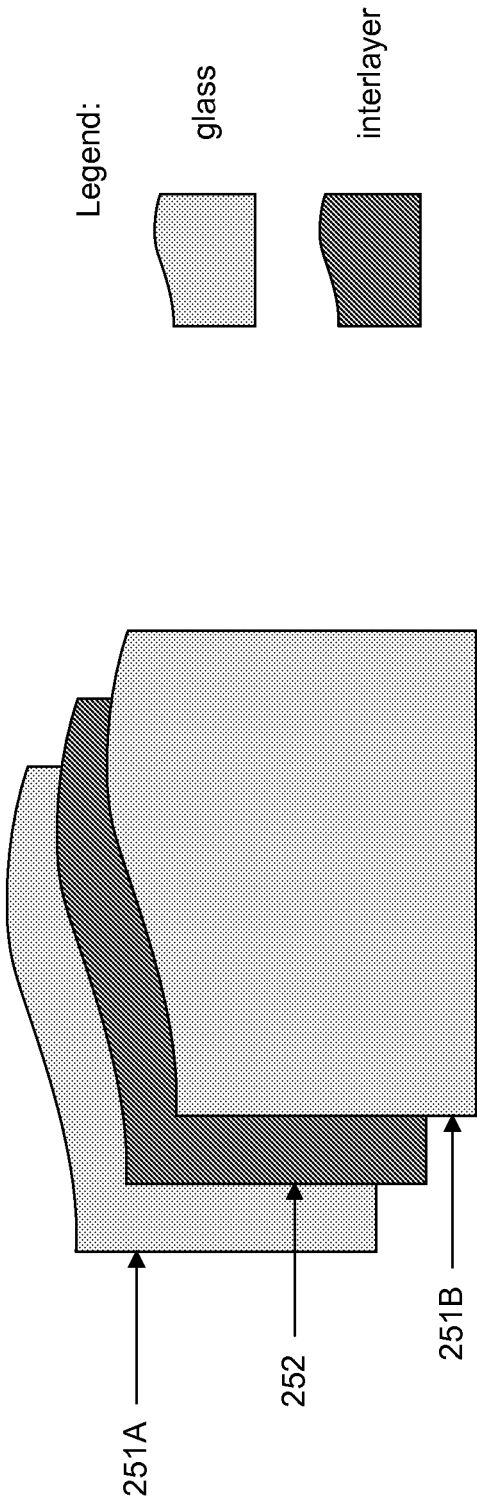
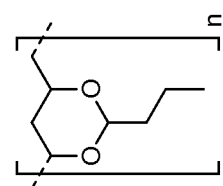
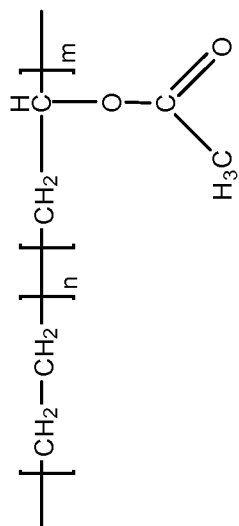


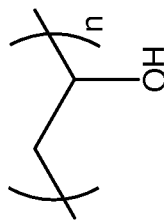
FIG. 25



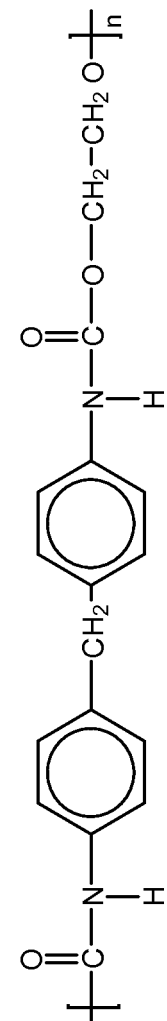
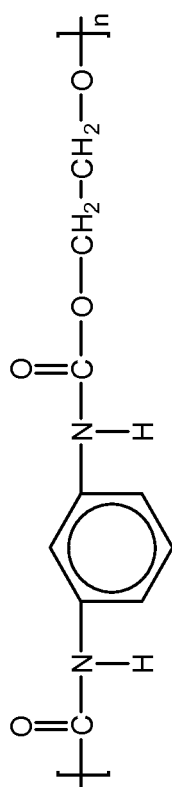
PVB



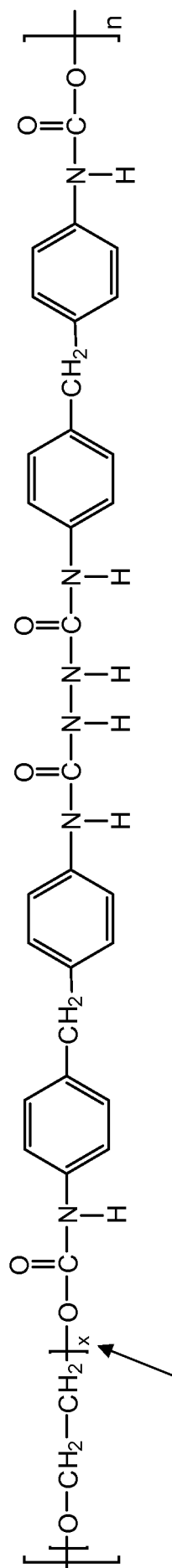
EVA



PVA



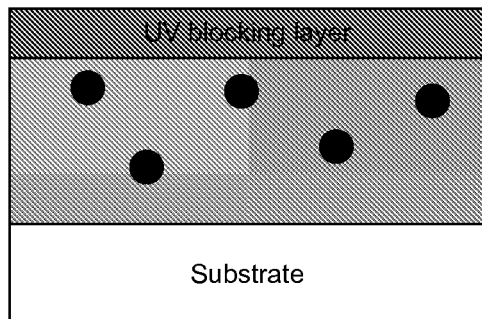
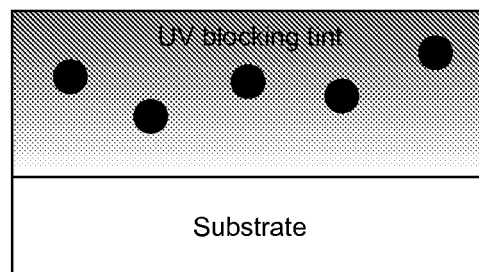
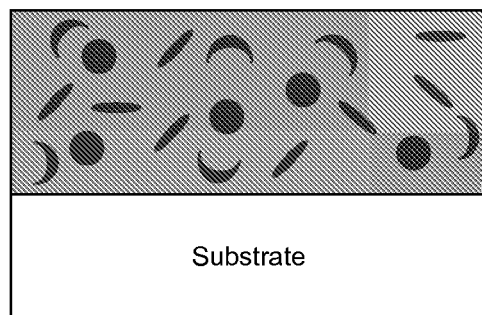
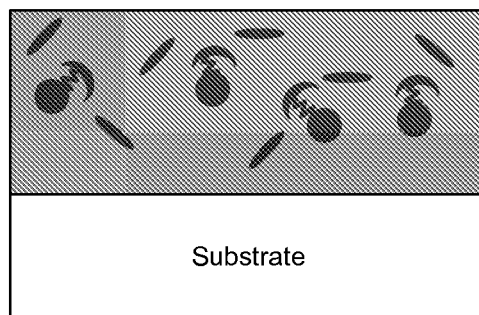
Two types of PU



PU-copolymer

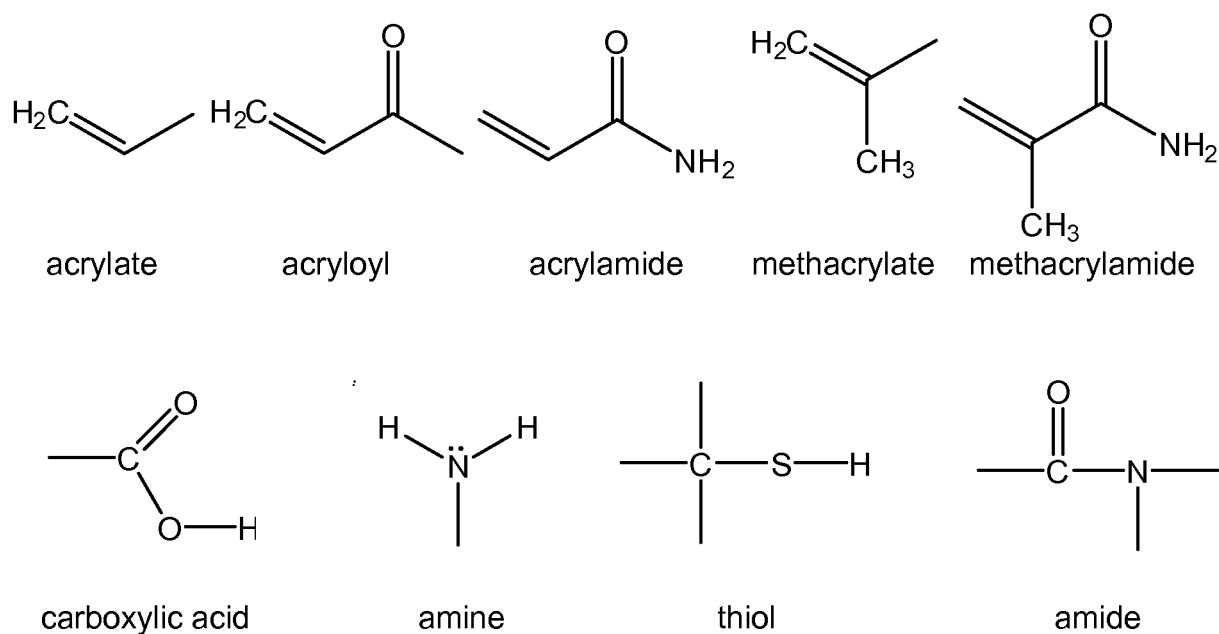
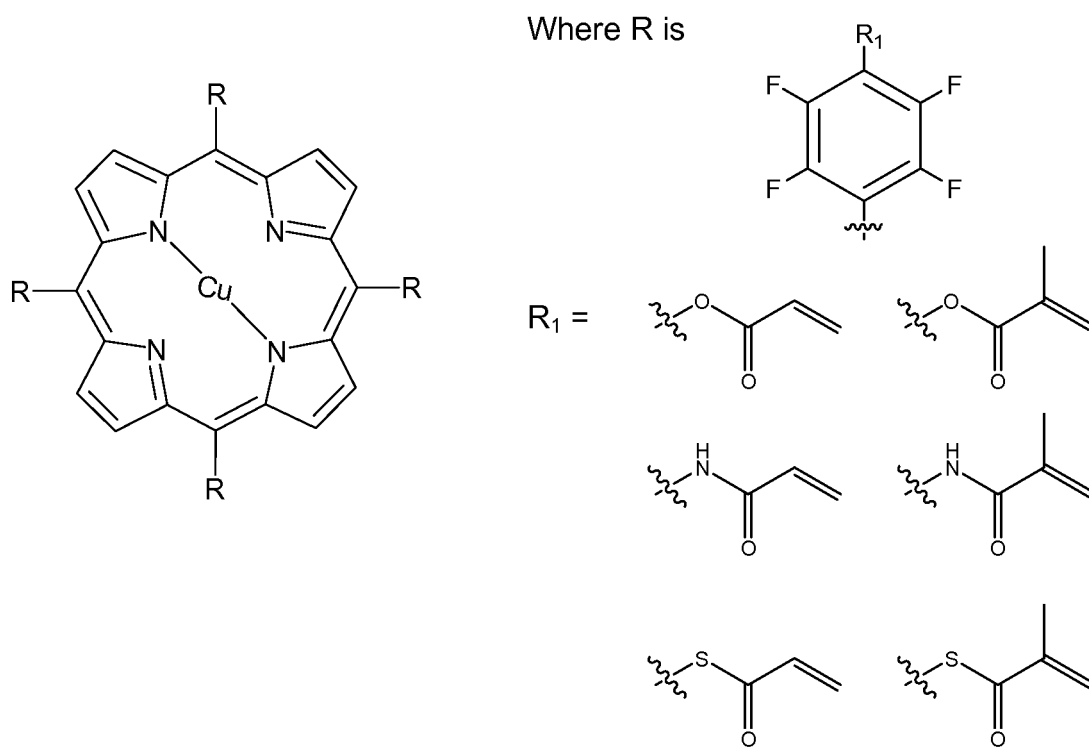
x = about 40 or so

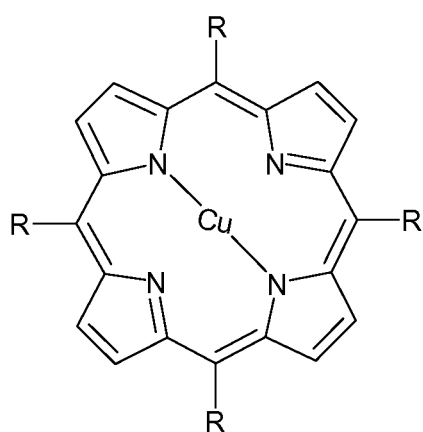
FIG. 26

**FIG. 27A****FIG. 27B****FIG. 27C****FIG. 27D**

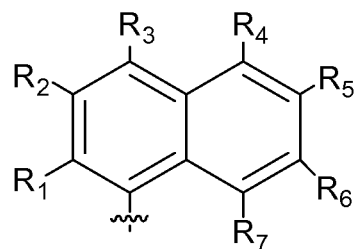
Legend:

- | | |
|--------------------|-----------------|
| ● Dye molecule | ⤿ UV blocker |
| ⚡ Covalent linkage | ↙ UV stabilizer |

**FIG. 28A****FIG. 28B**



Where R is



R₁₋₇ = H,

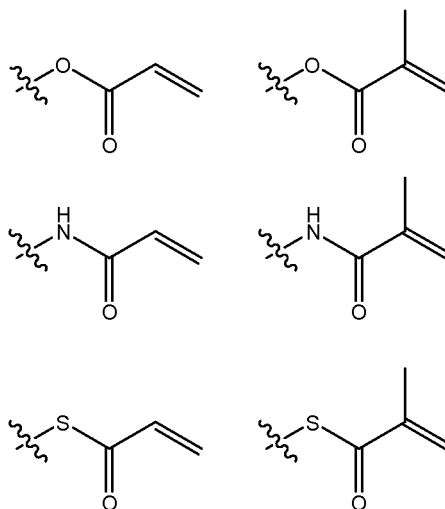
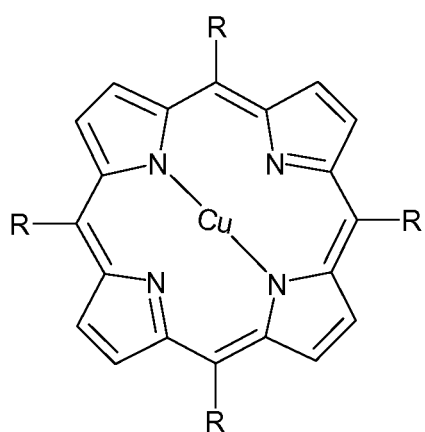
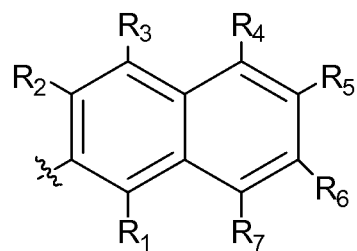


FIG. 28C



Where R is



R₁₋₇ = H,

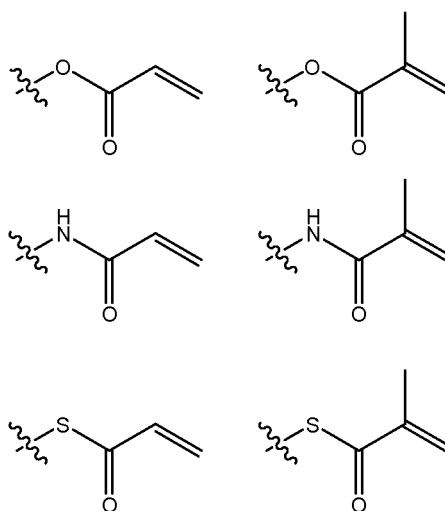
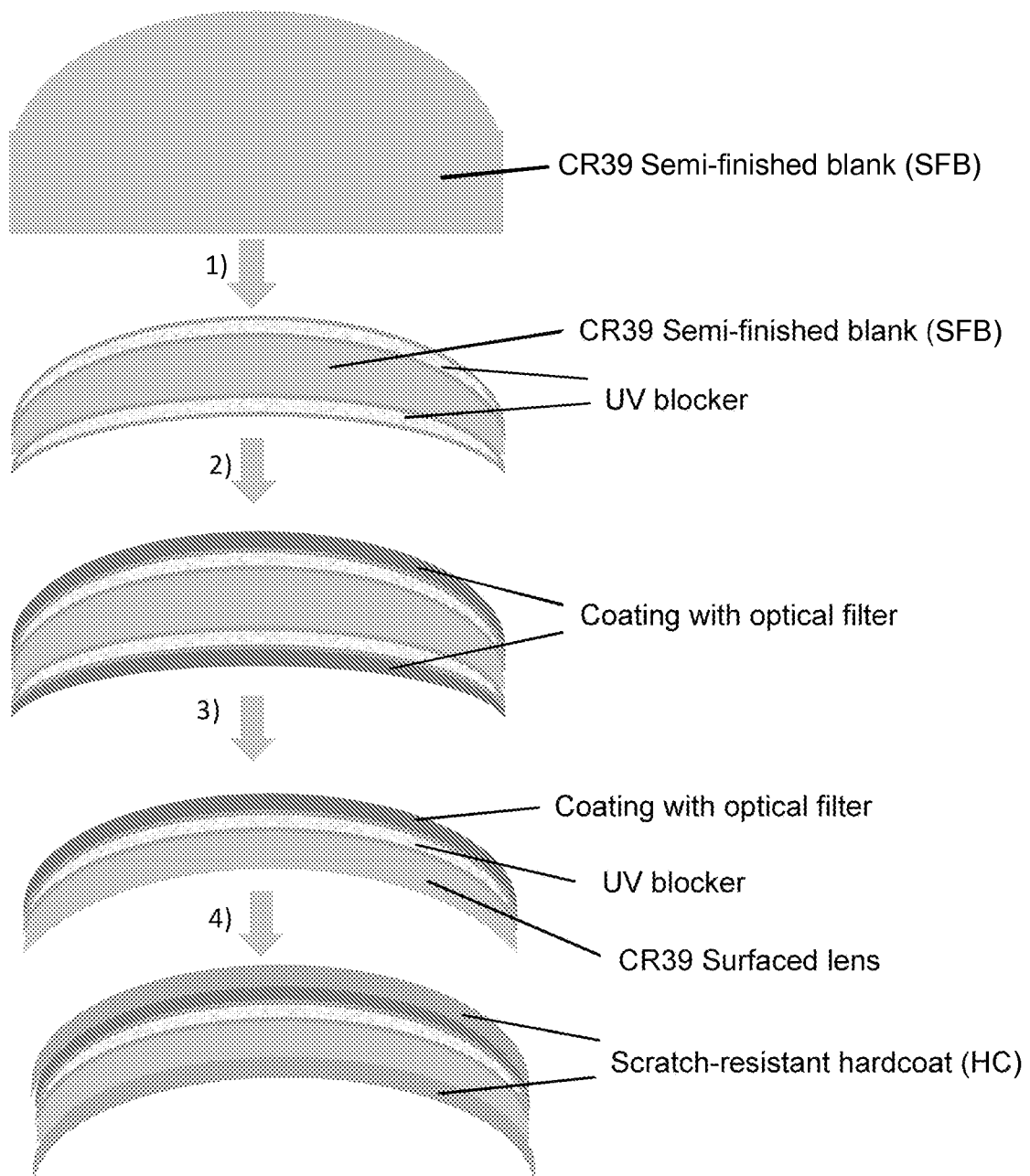
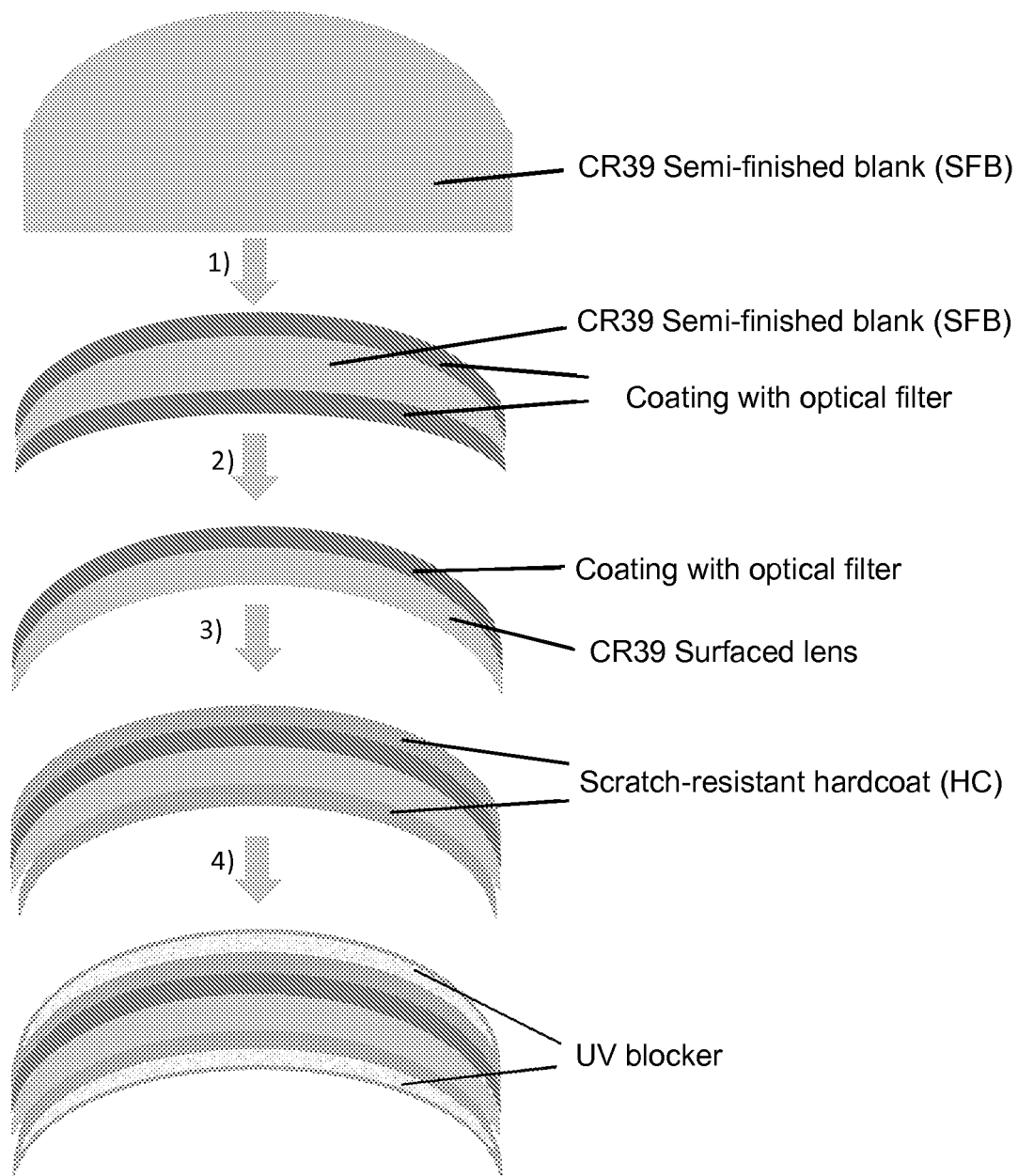
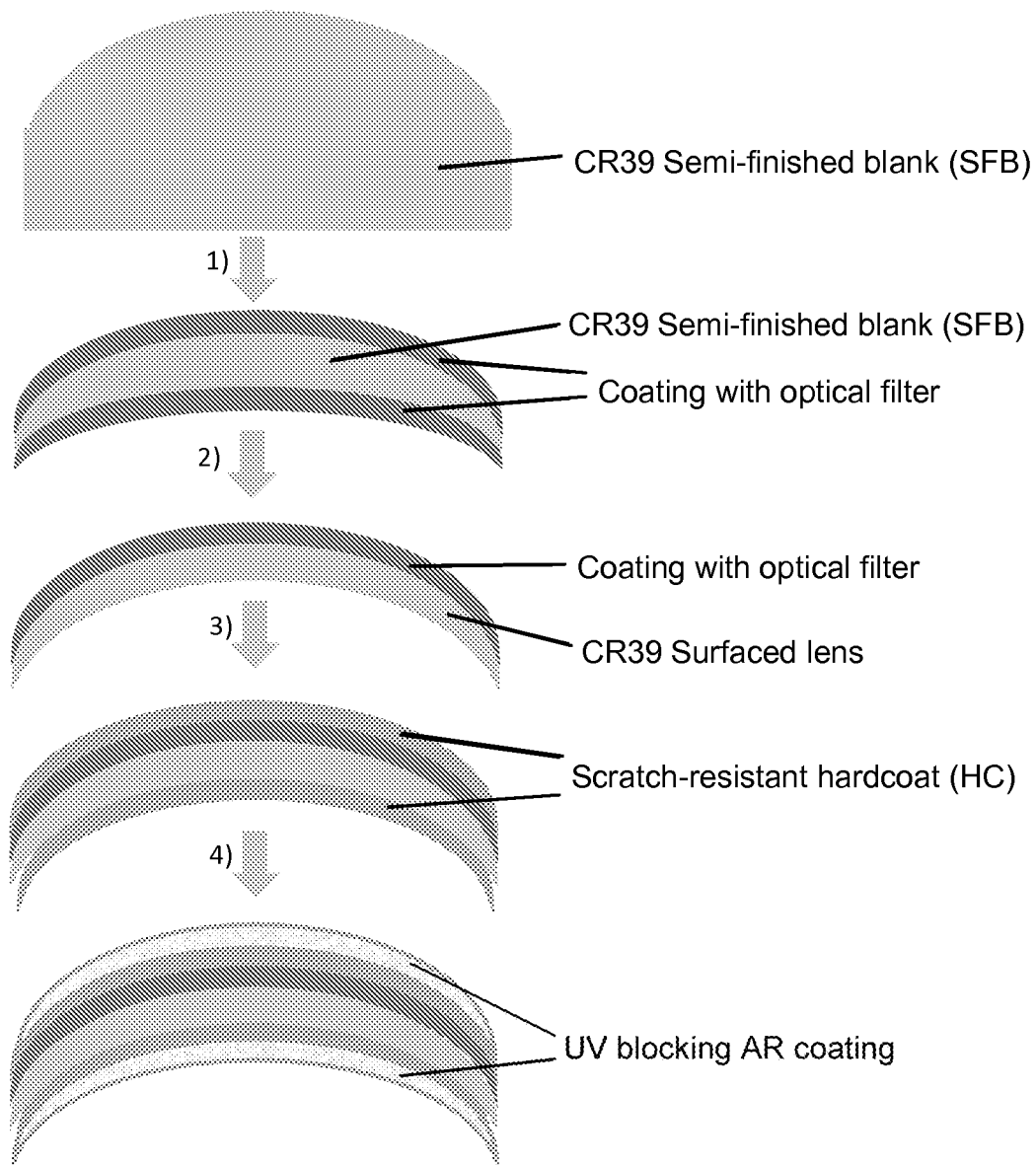
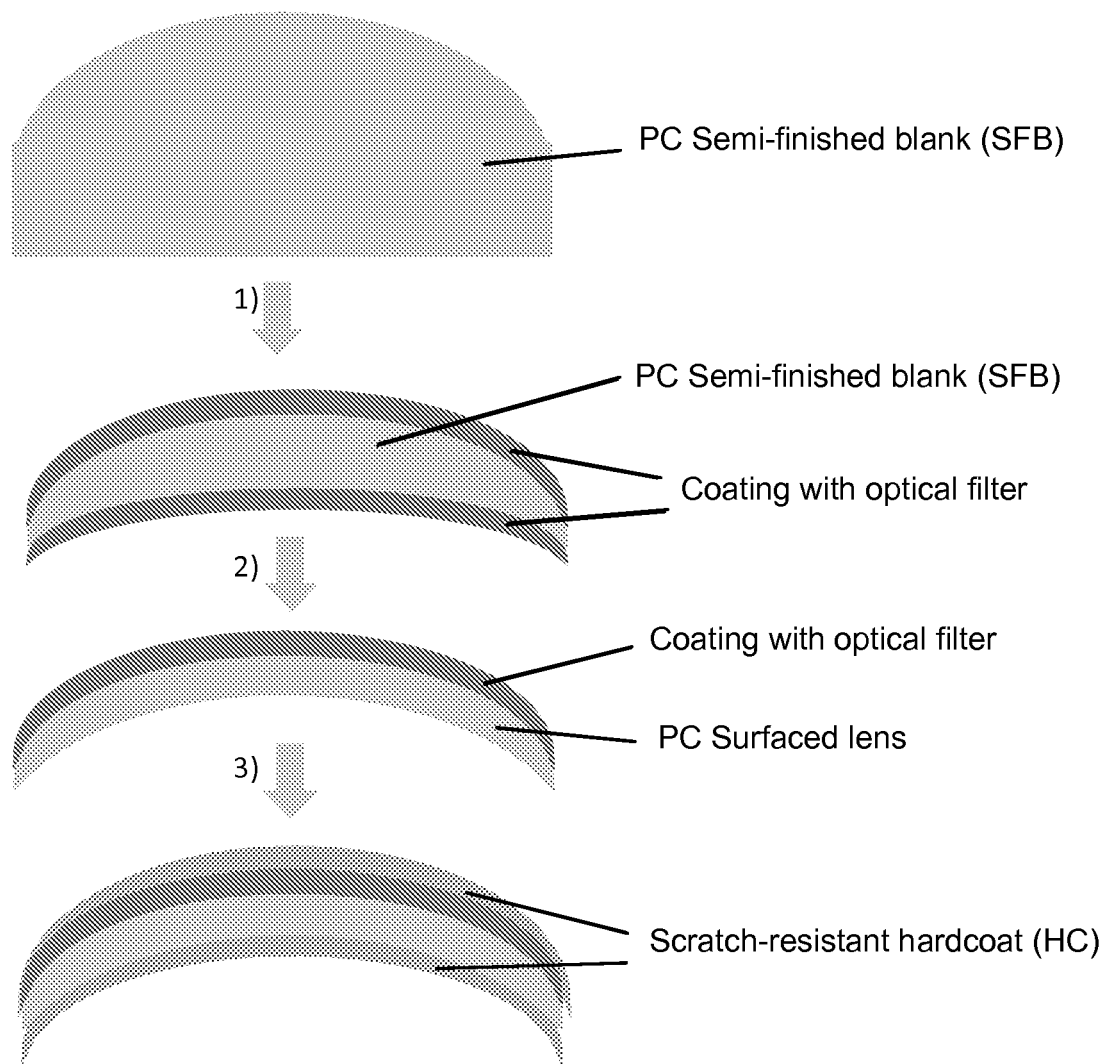


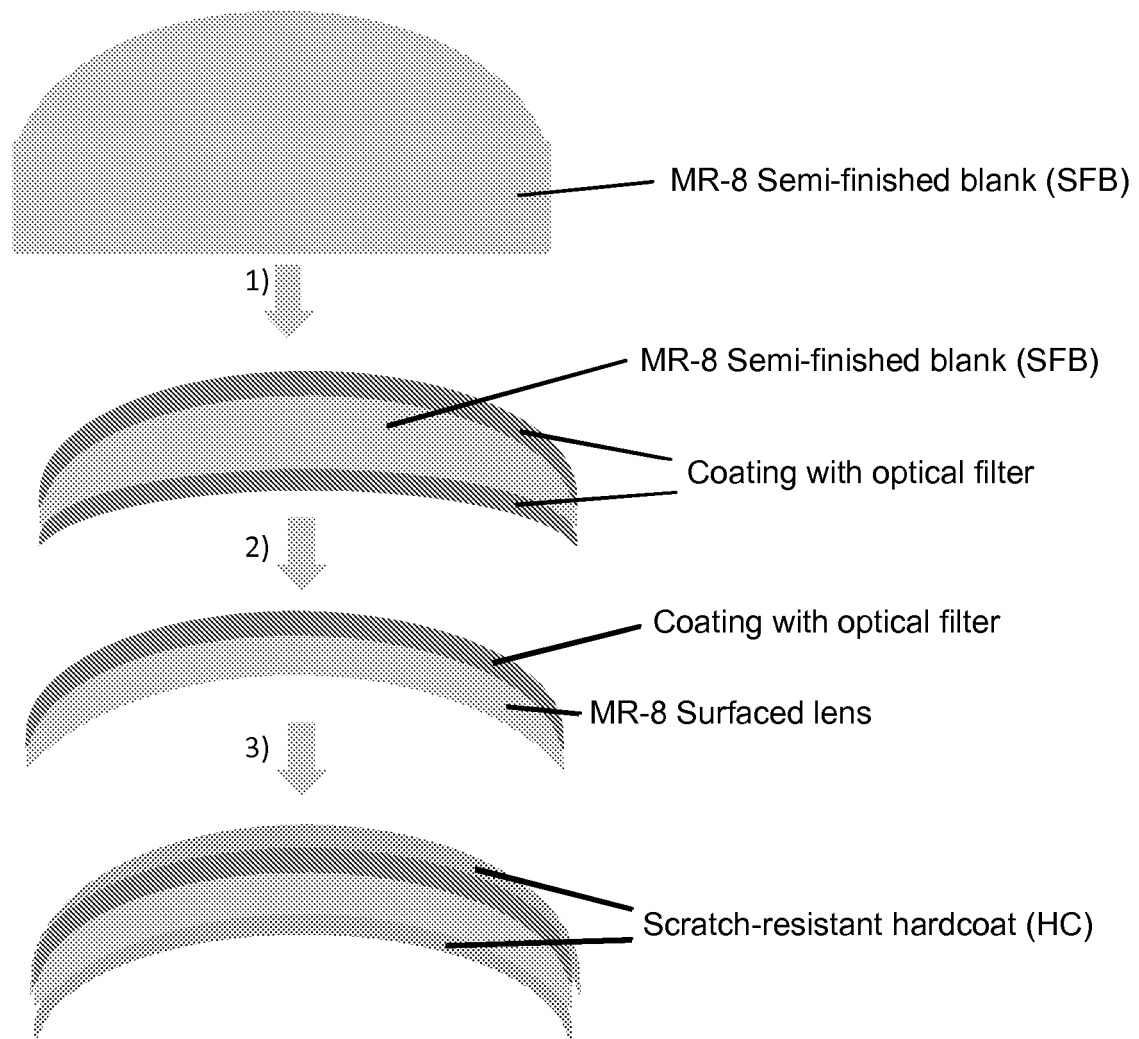
FIG. 28D

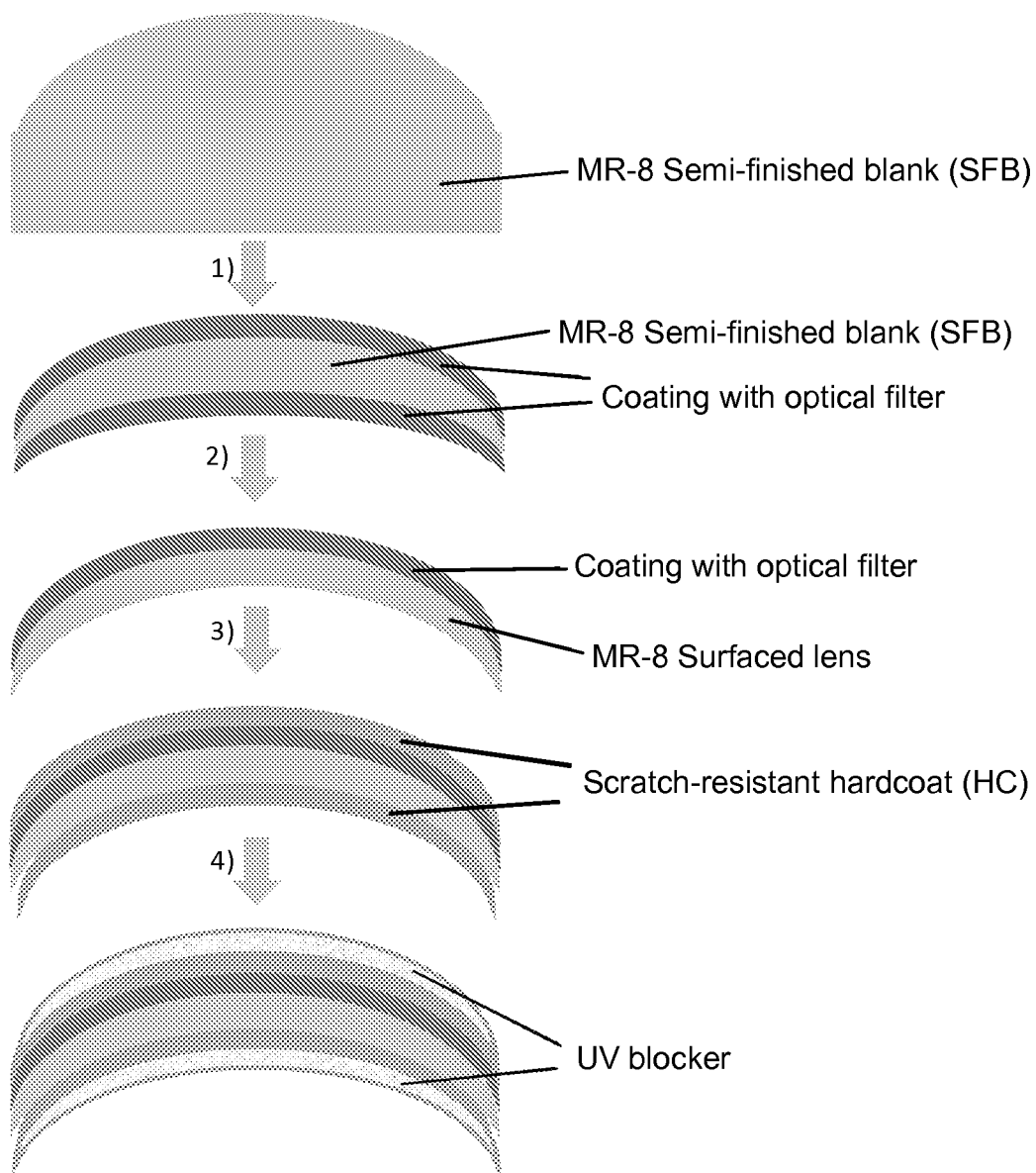
**FIG. 29A**

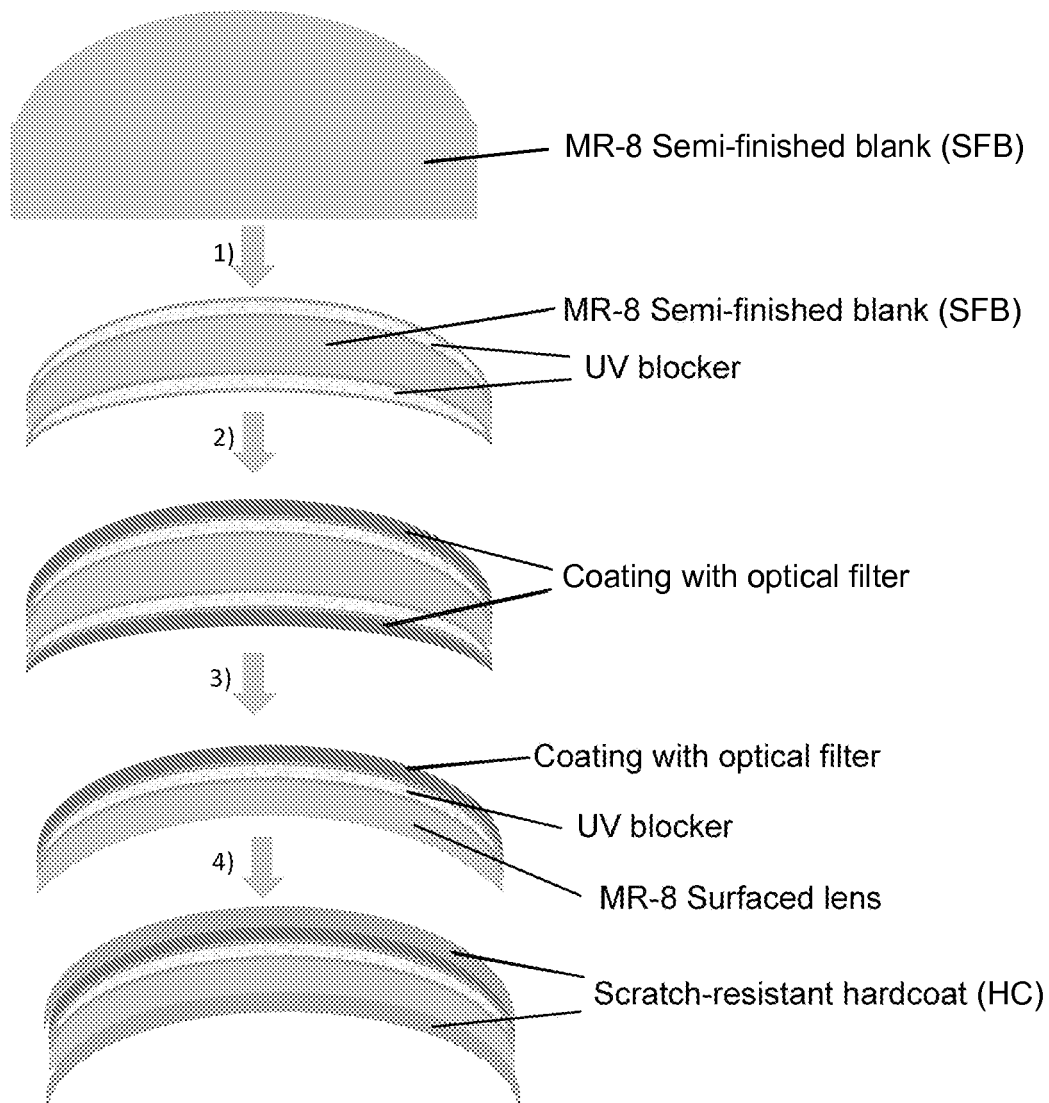
**FIG. 29B**

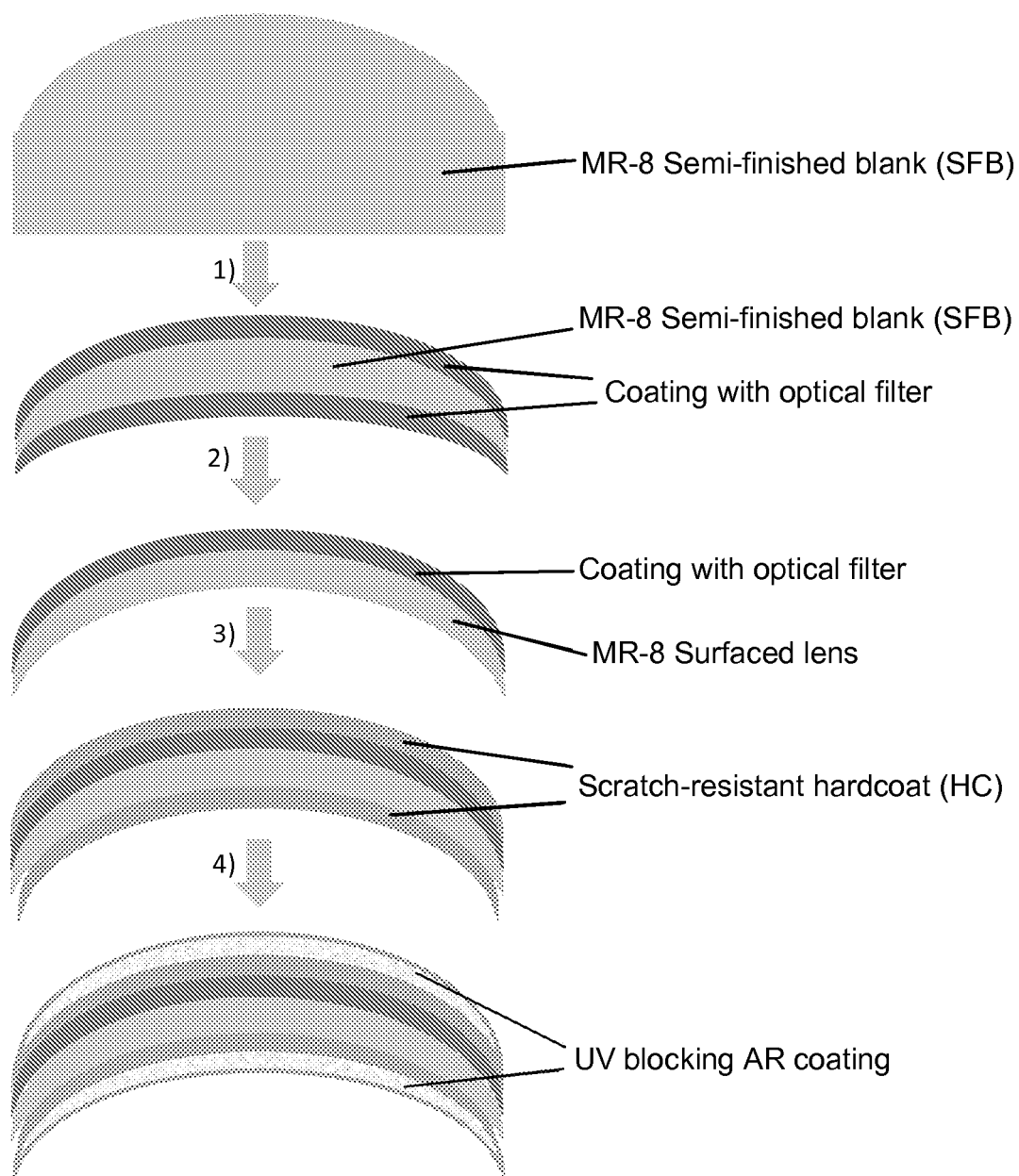
**FIG. 29C**

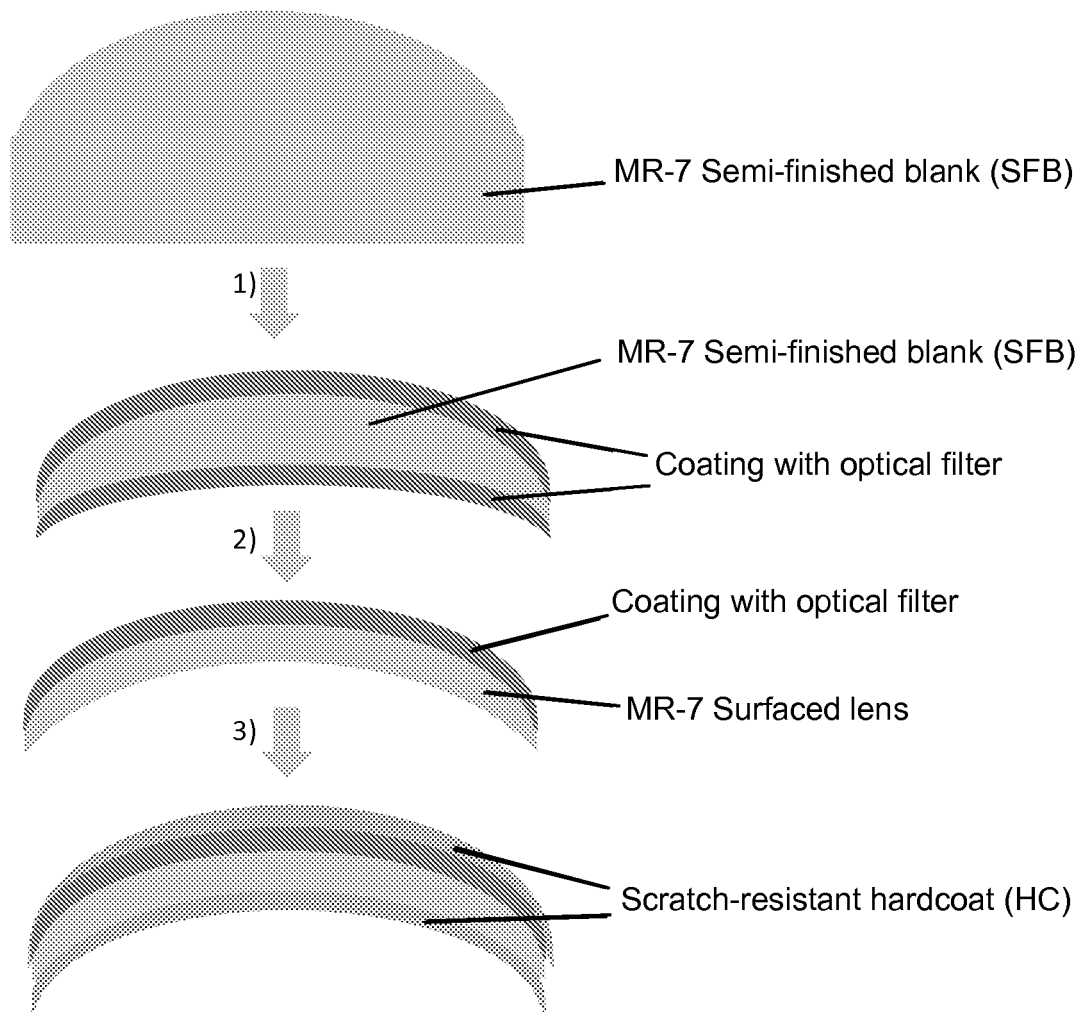
**FIG. 30**

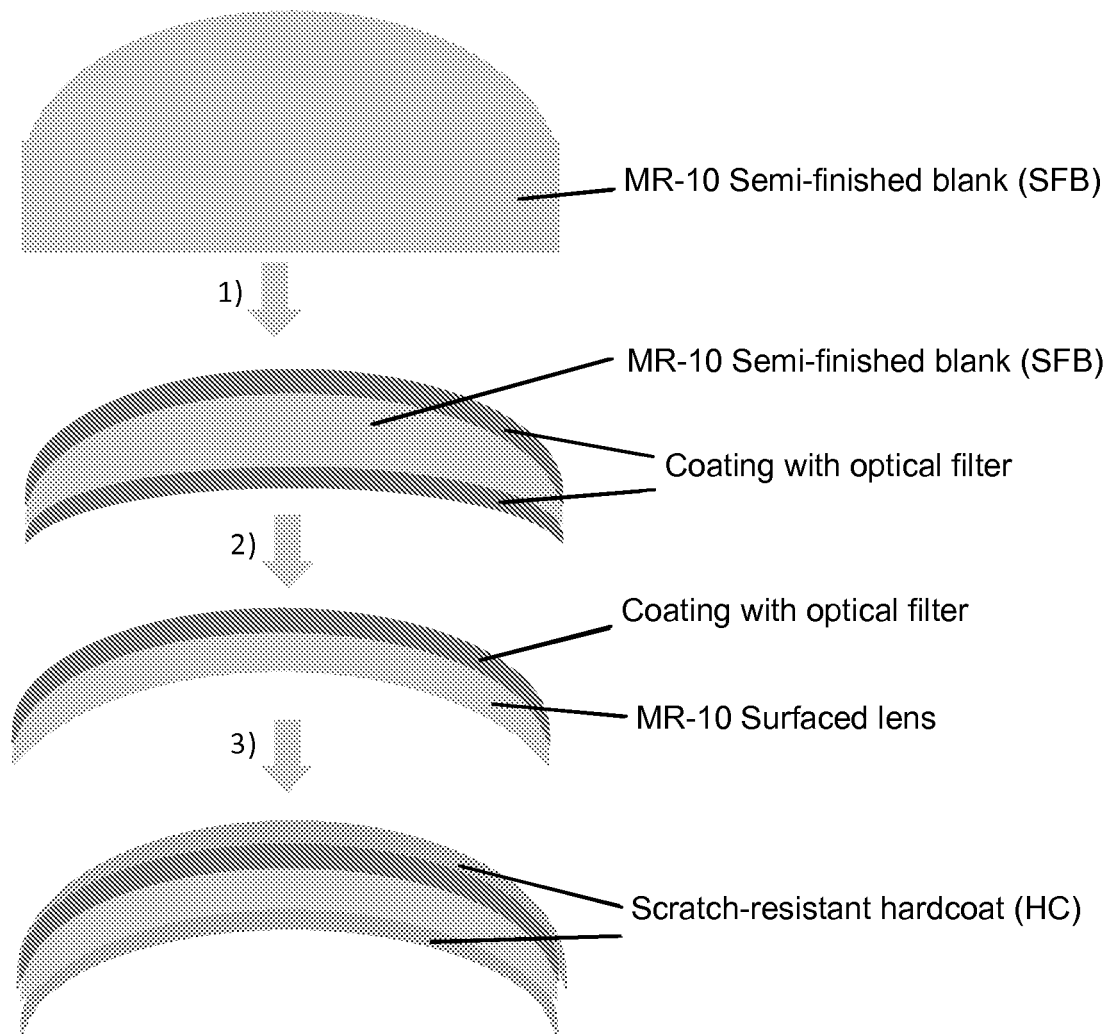
**FIG. 31**

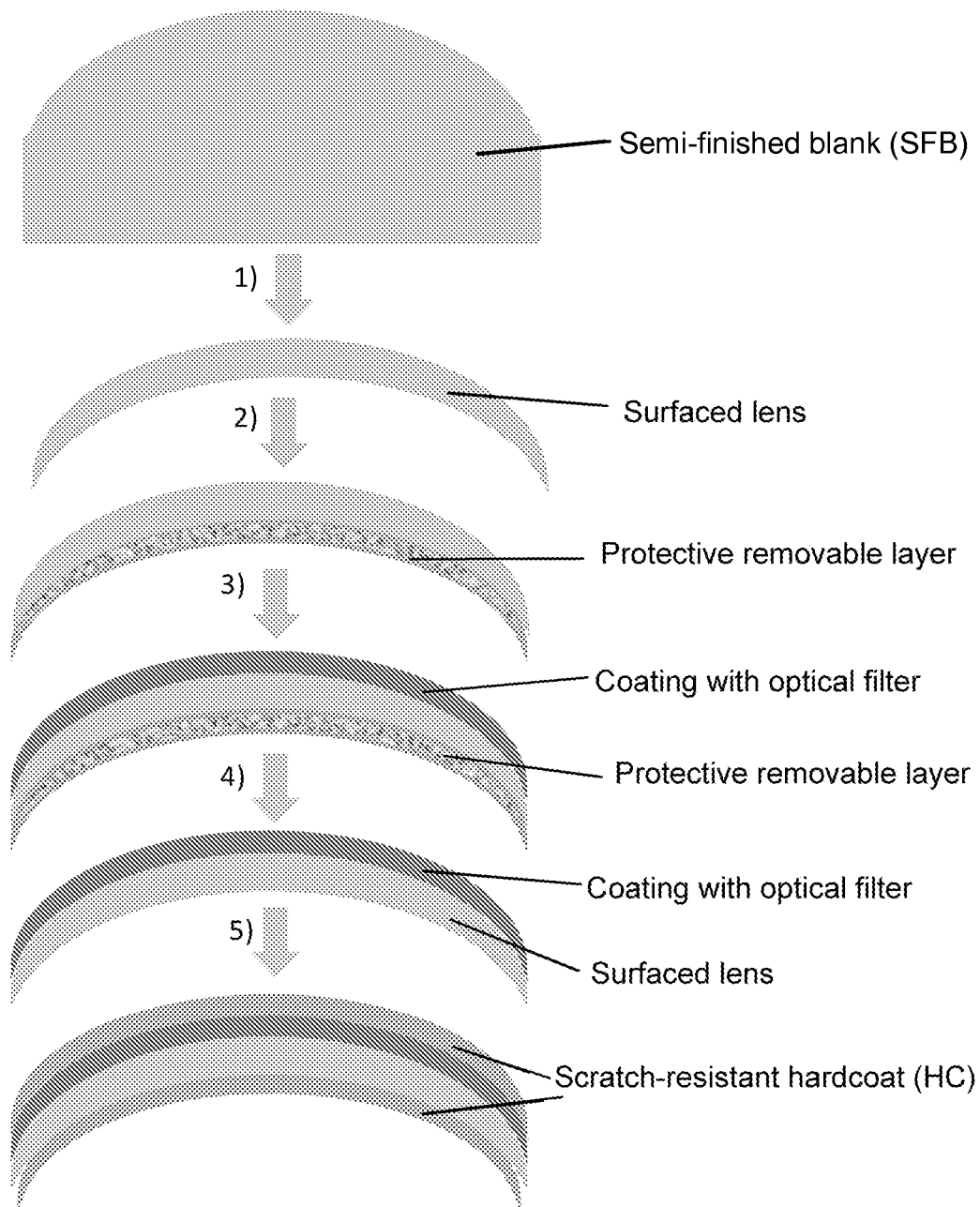
**FIG. 32A**

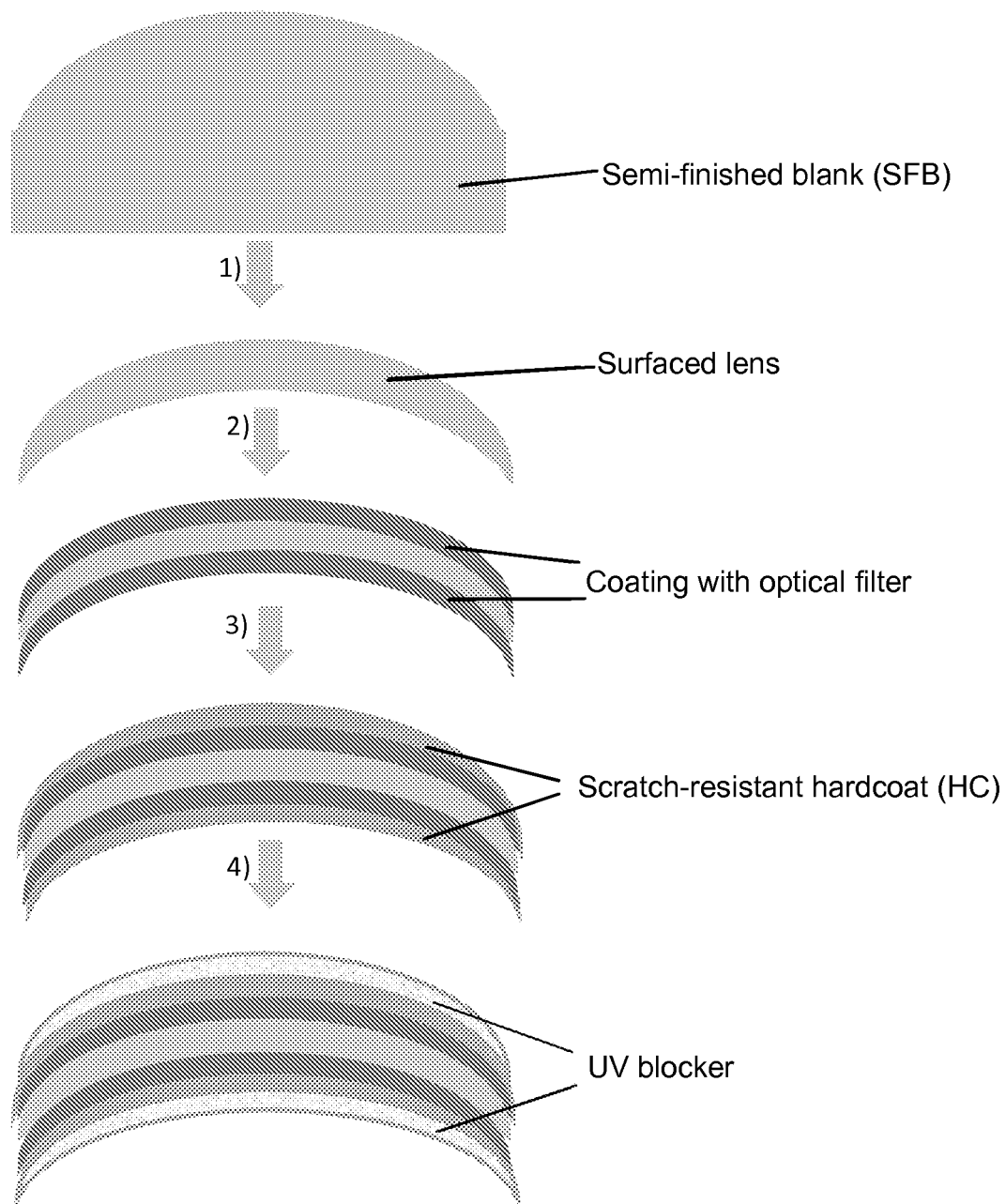
**FIG. 32B**

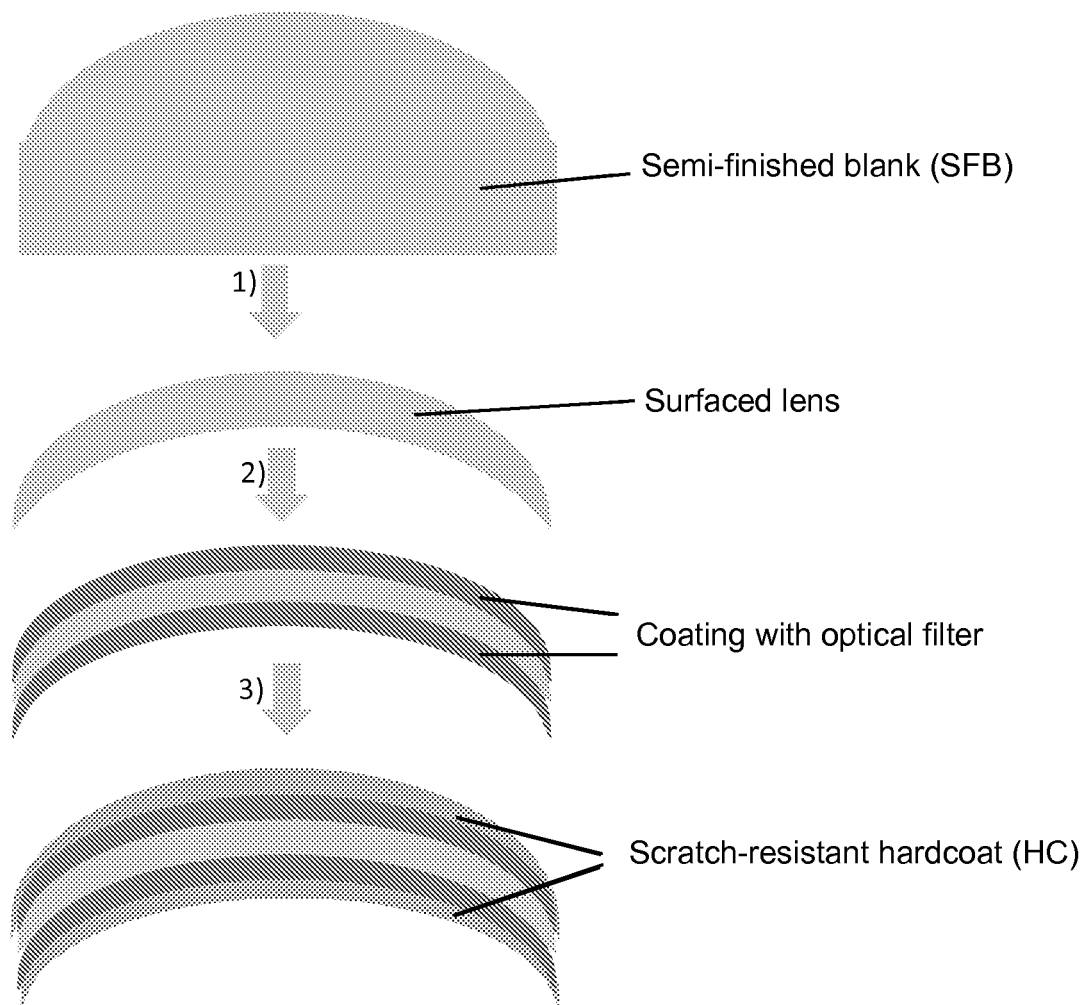
**FIG. 32C**

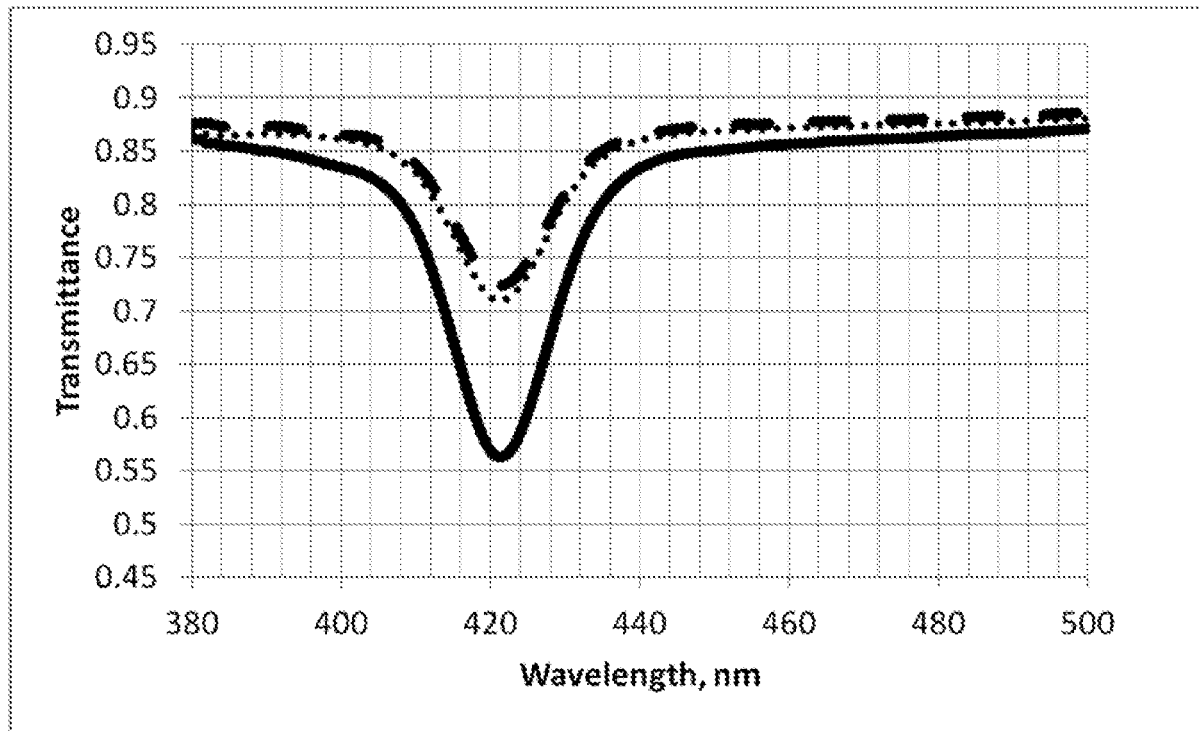
**FIG. 33**

**FIG. 34**

**FIG. 35**

**FIG. 36**

**FIG. 37**

**FIG. 38**

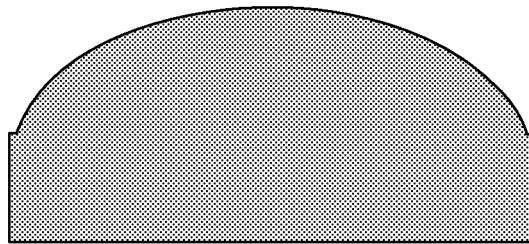


FIG. 39A

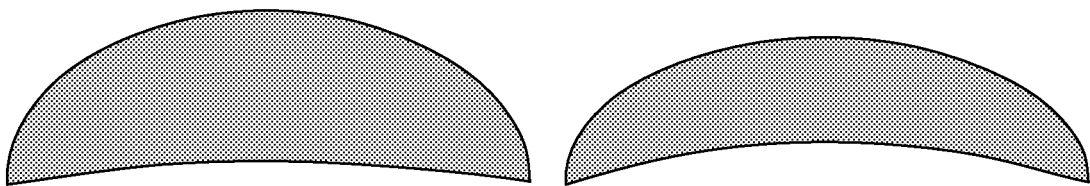


FIG. 39B

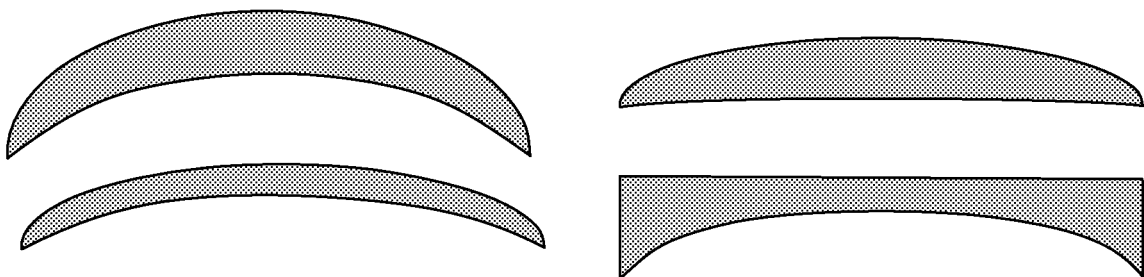


FIG. 39C

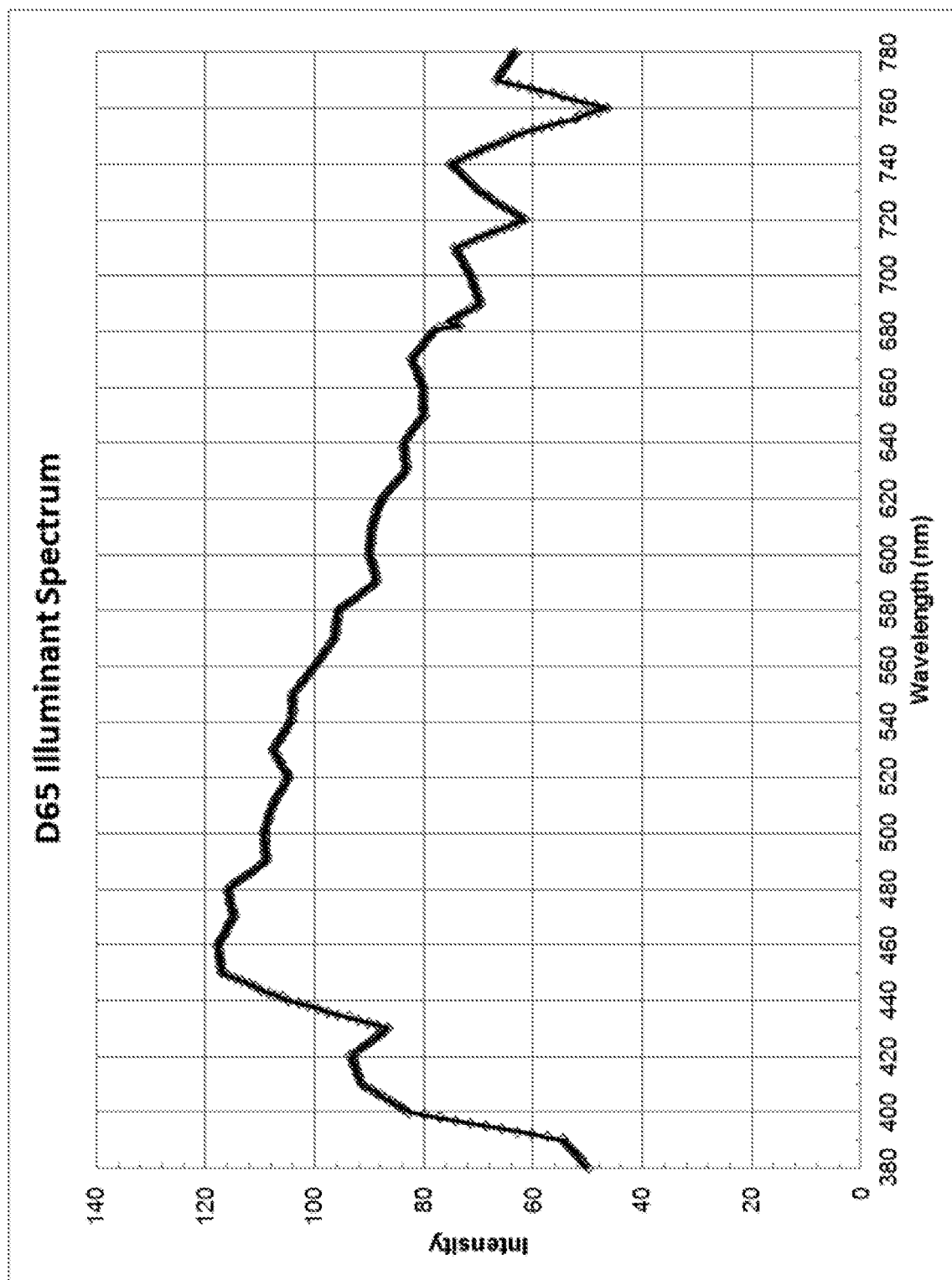
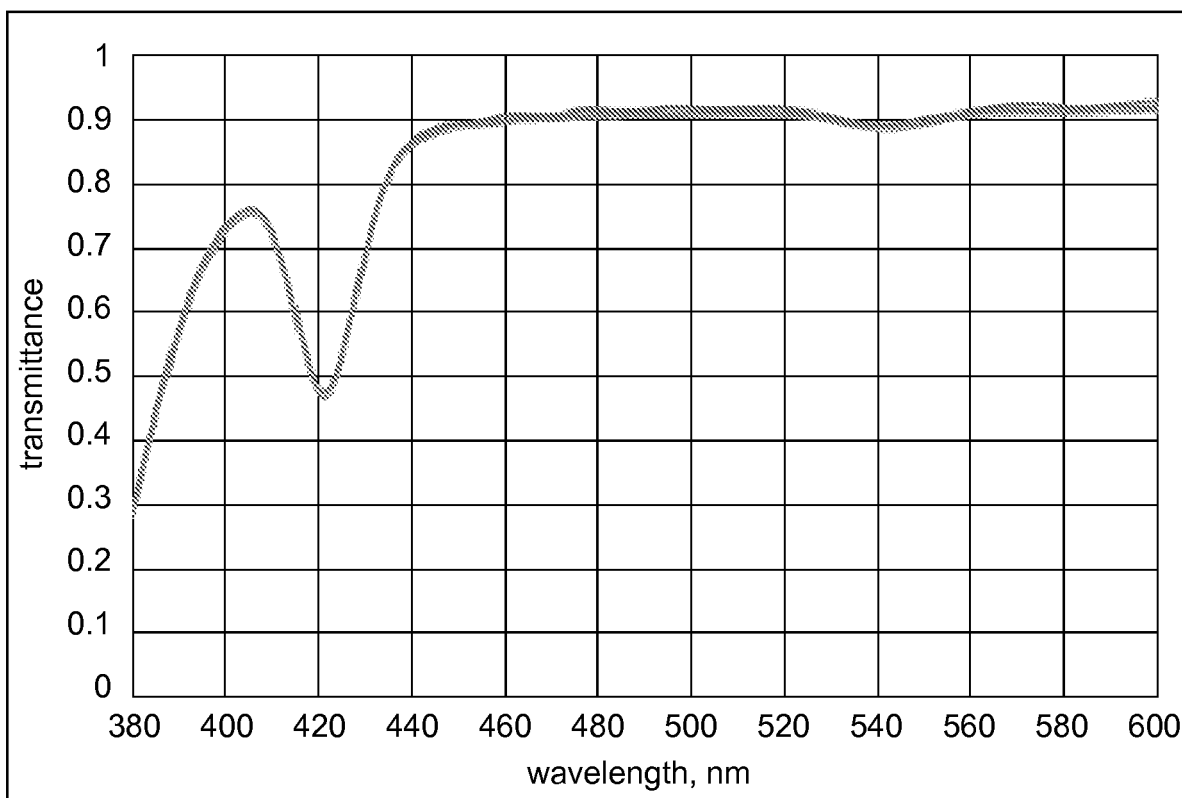
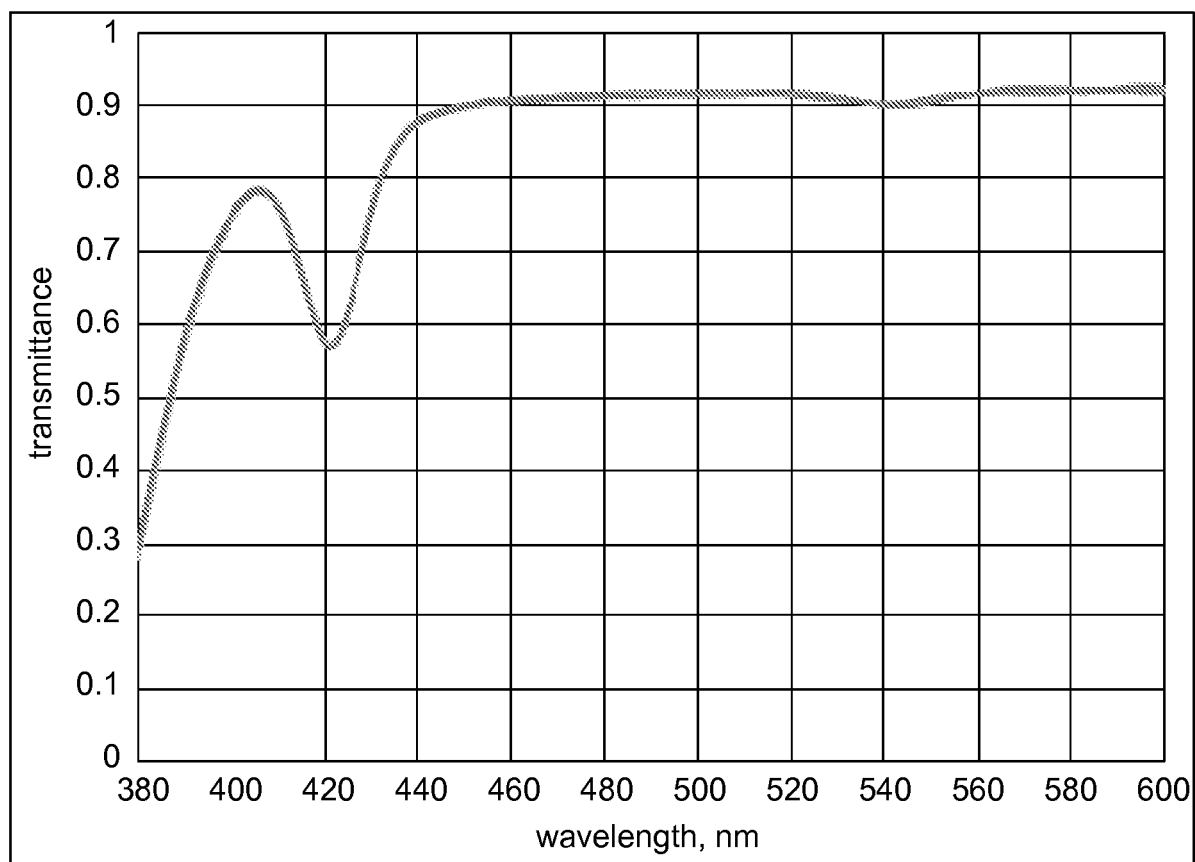
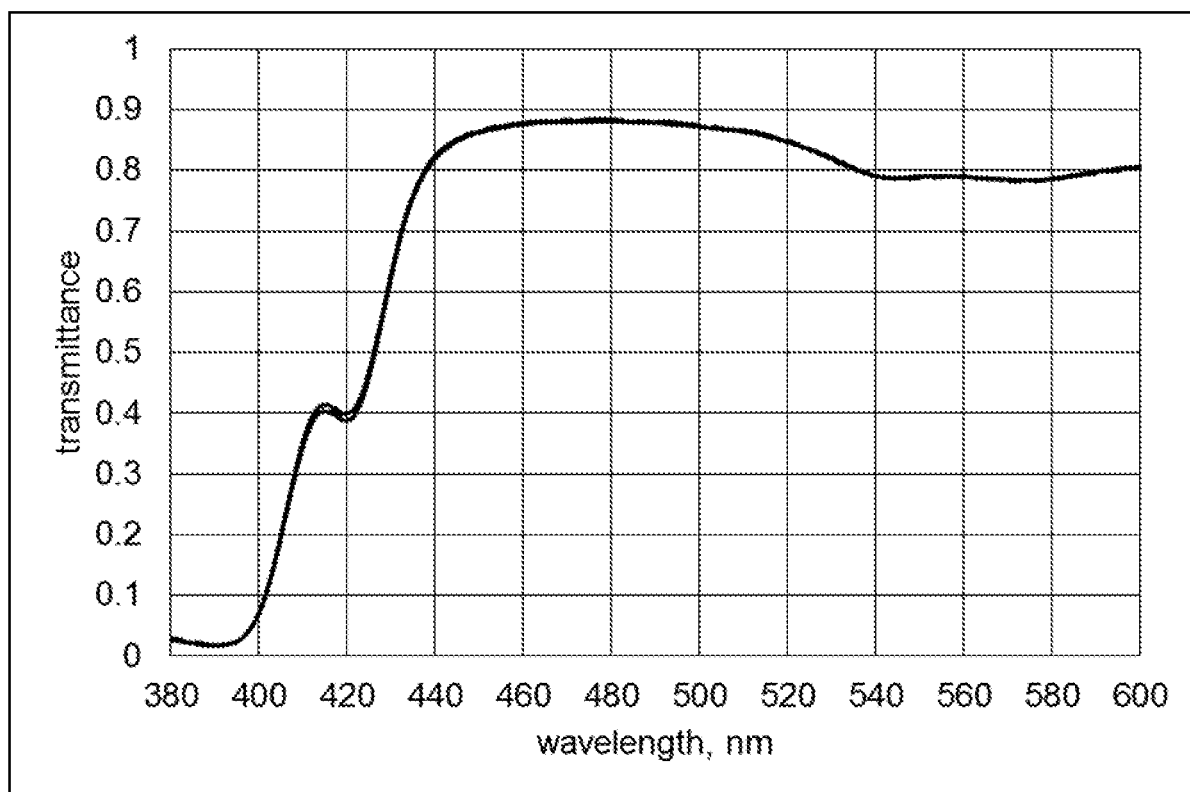
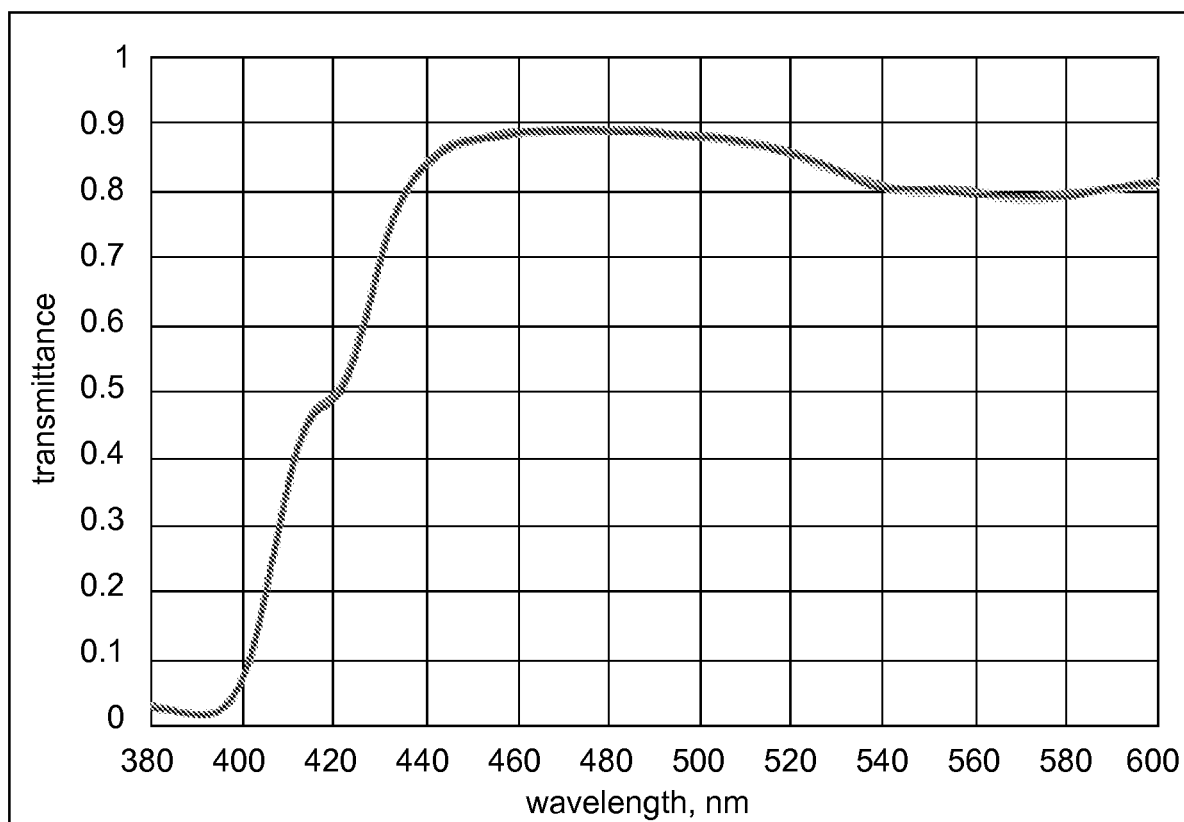
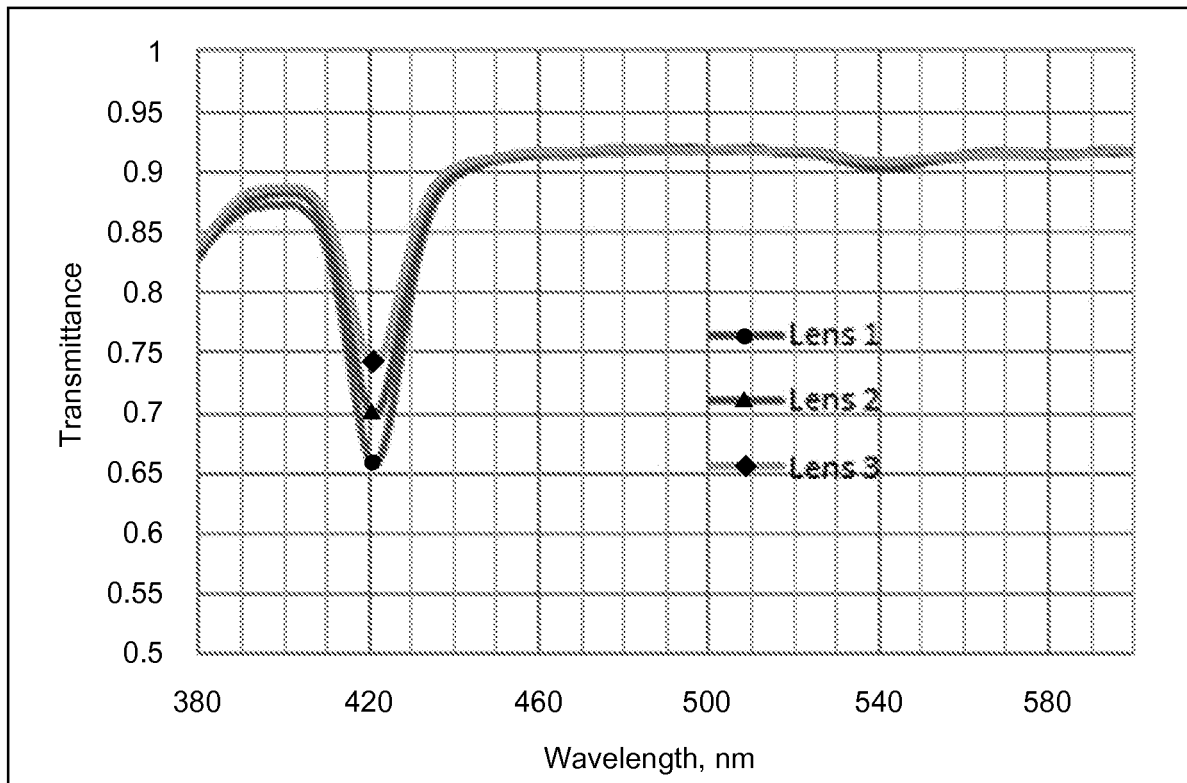
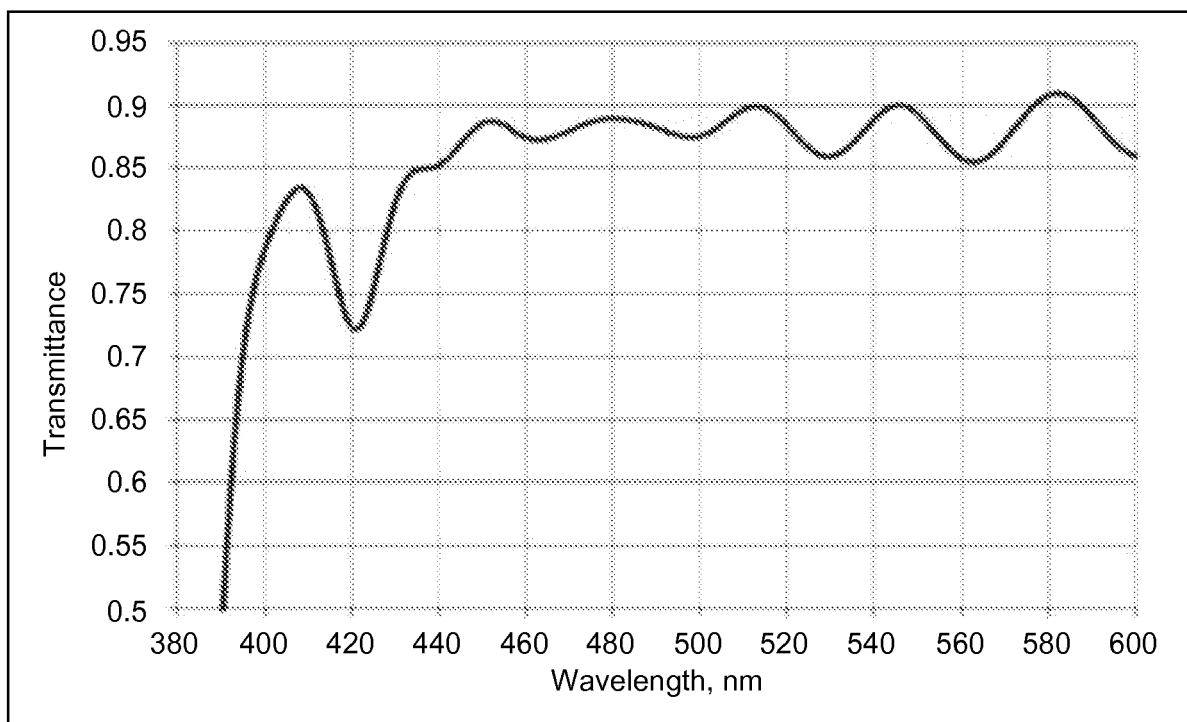
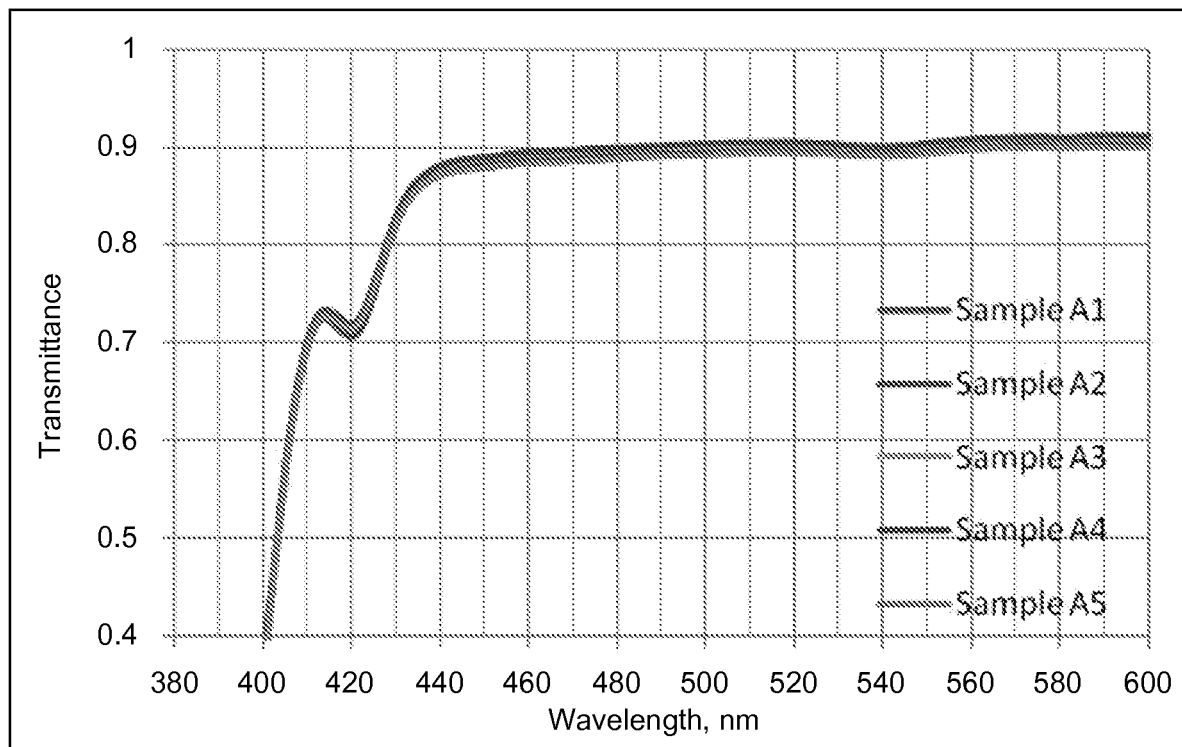
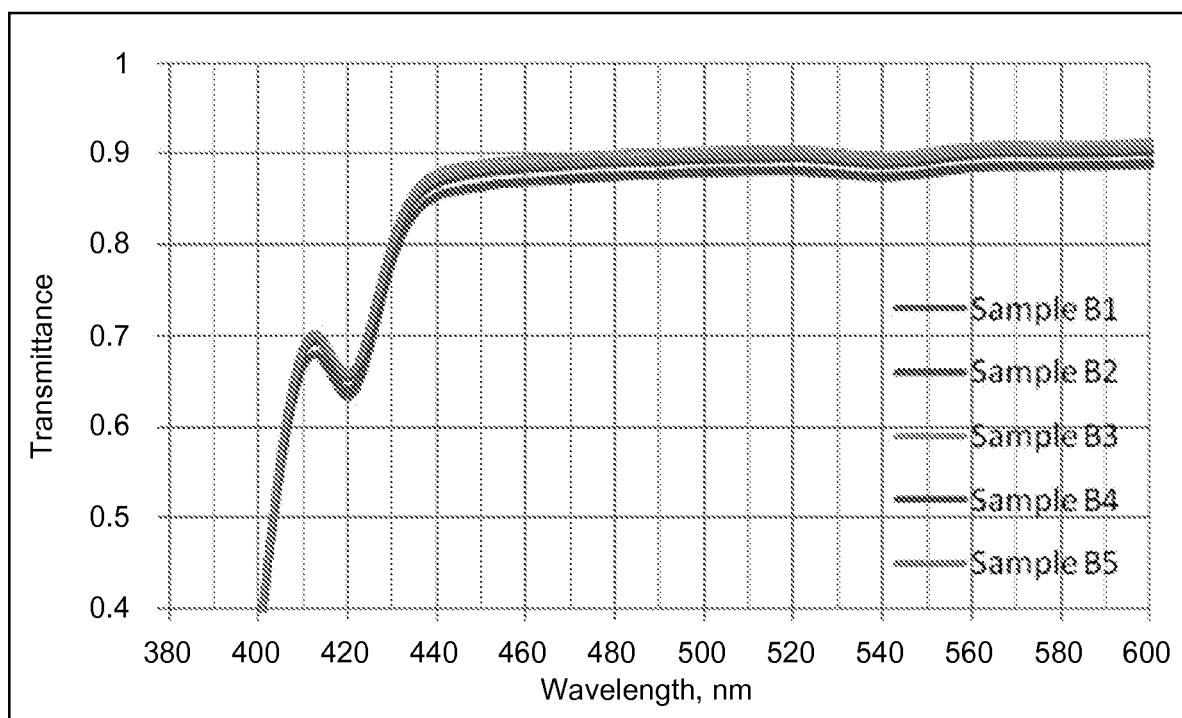


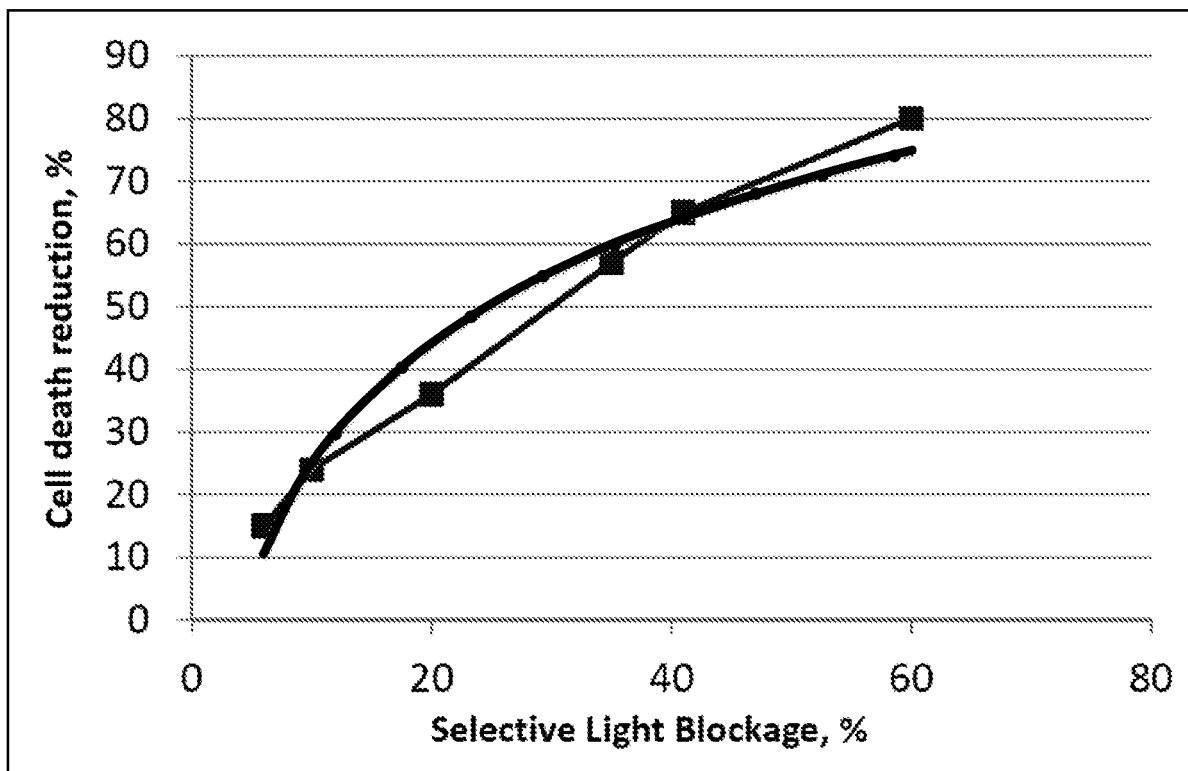
FIG. 40

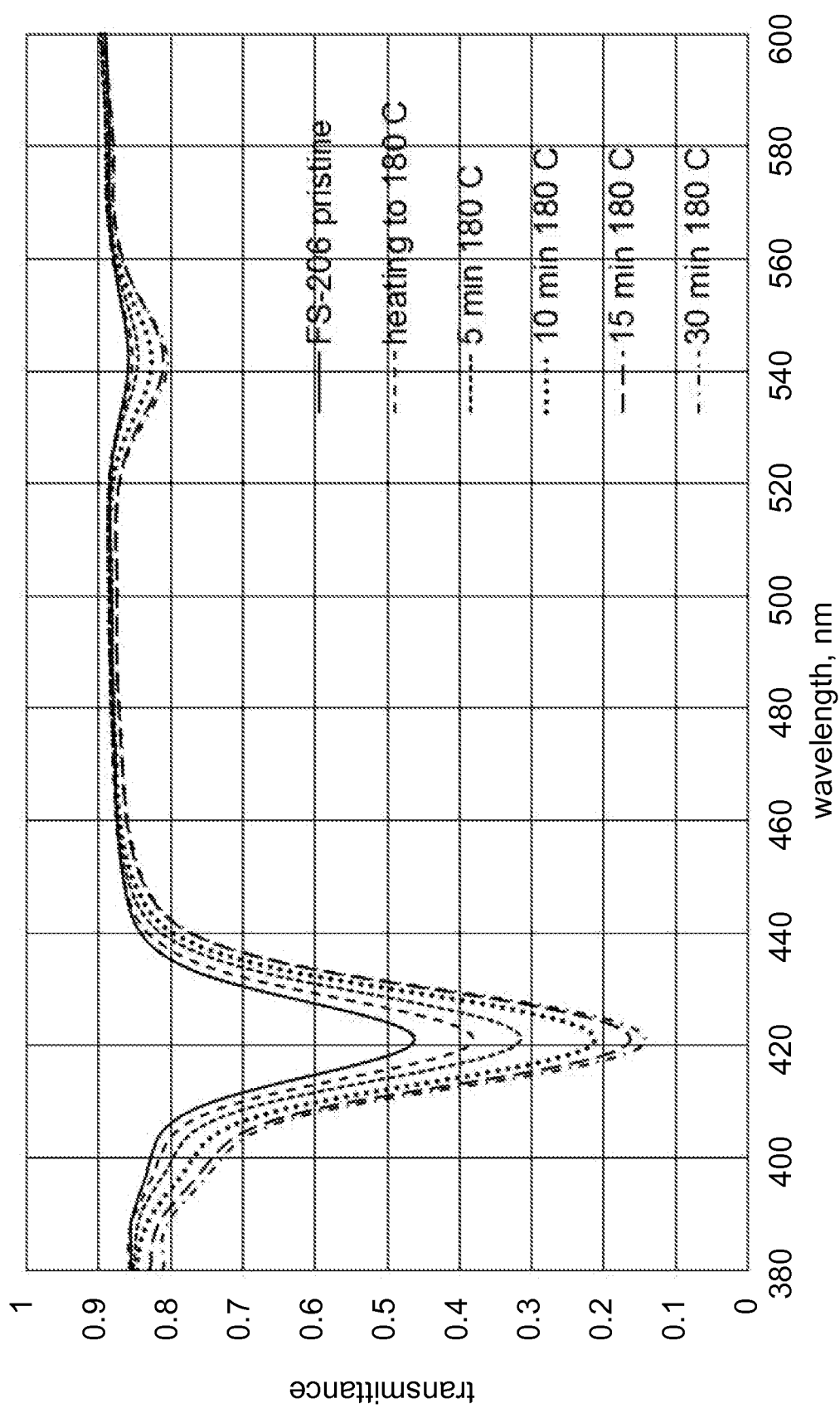
**FIG. 41****FIG. 42**

**FIG. 43****FIG. 44**

**FIG. 45****FIG. 46**

**FIG. 47****FIG. 48**

**FIG. 49**

**FIG. 50A**

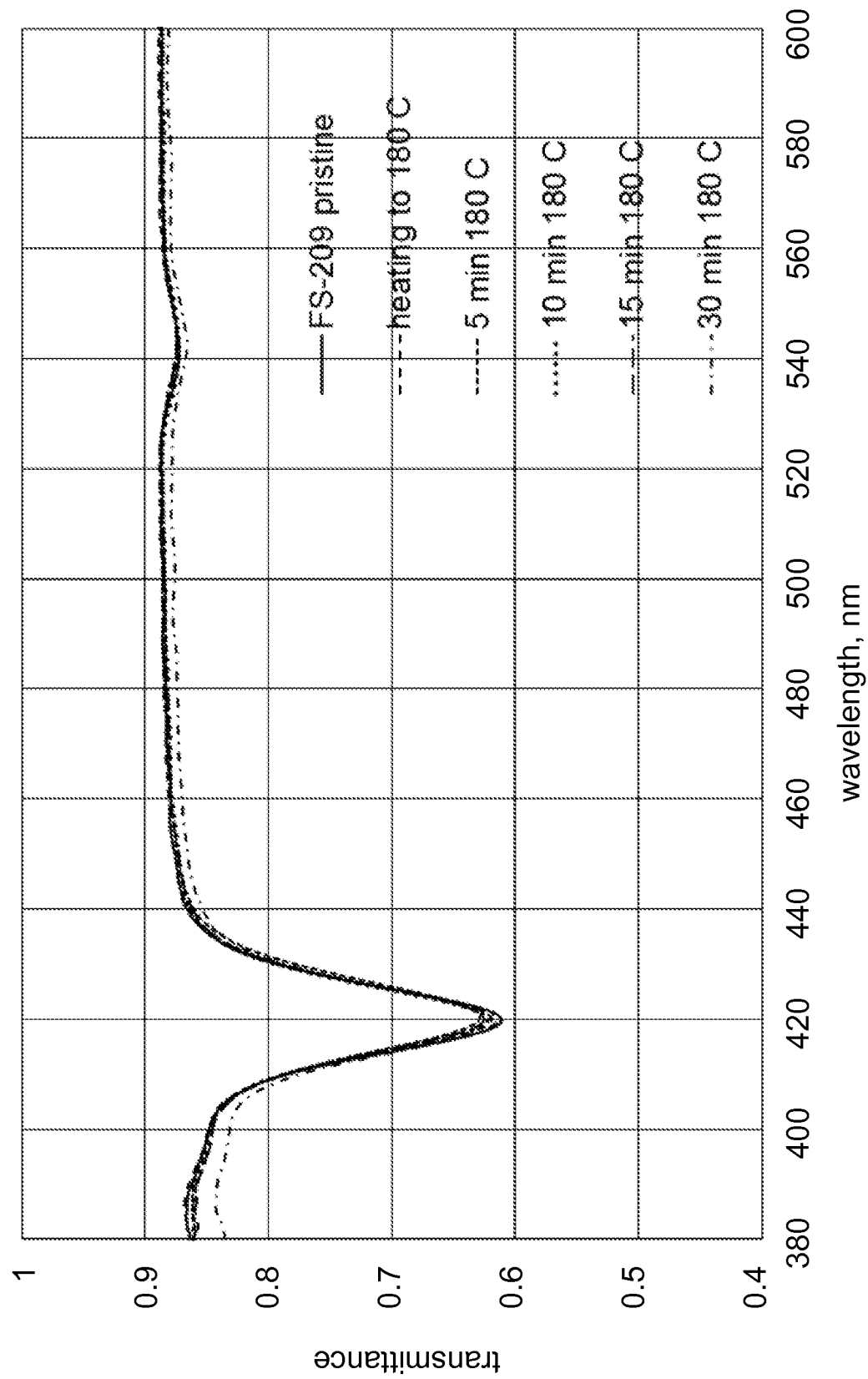


FIG. 50B

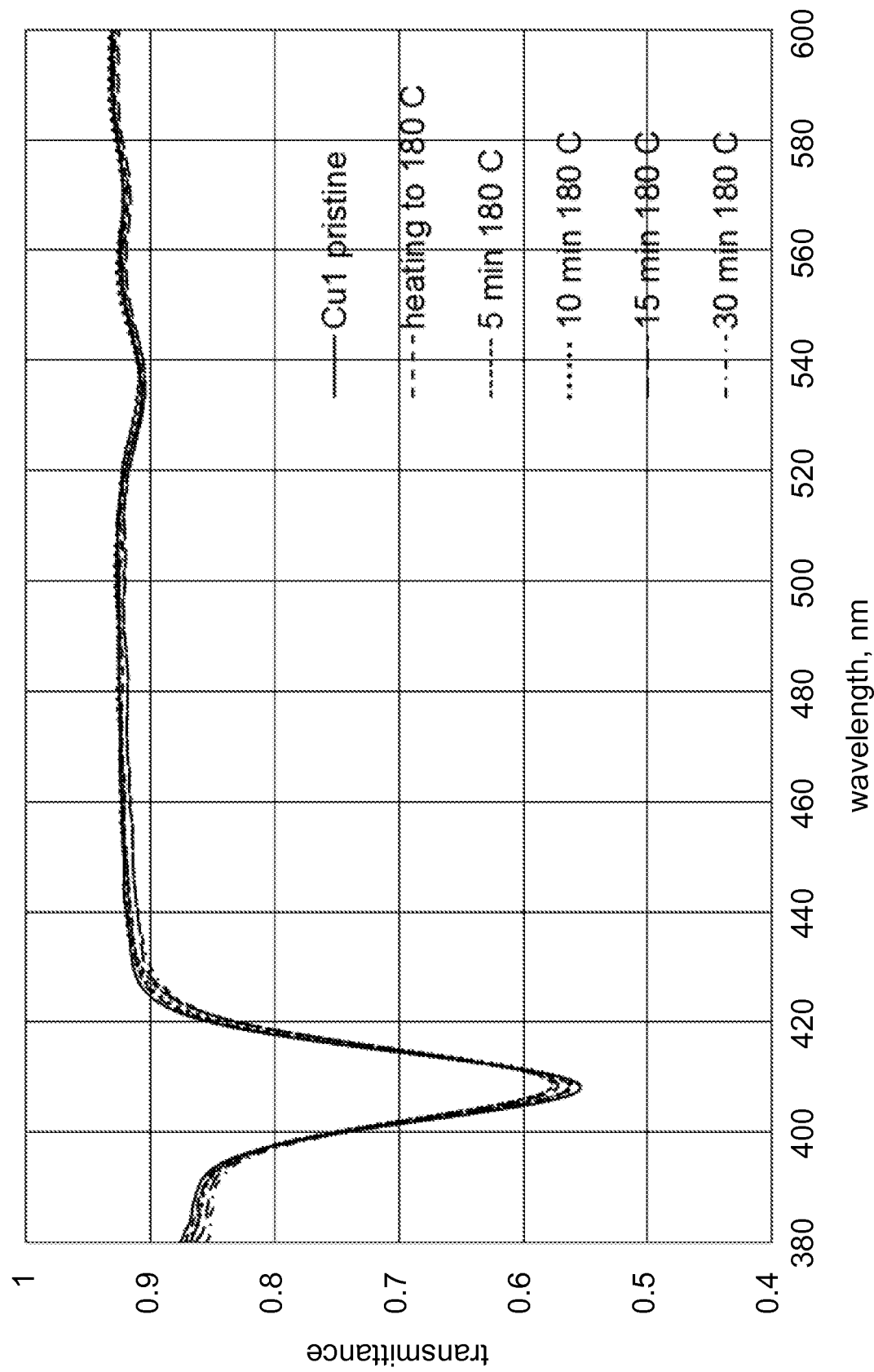


FIG. 50C

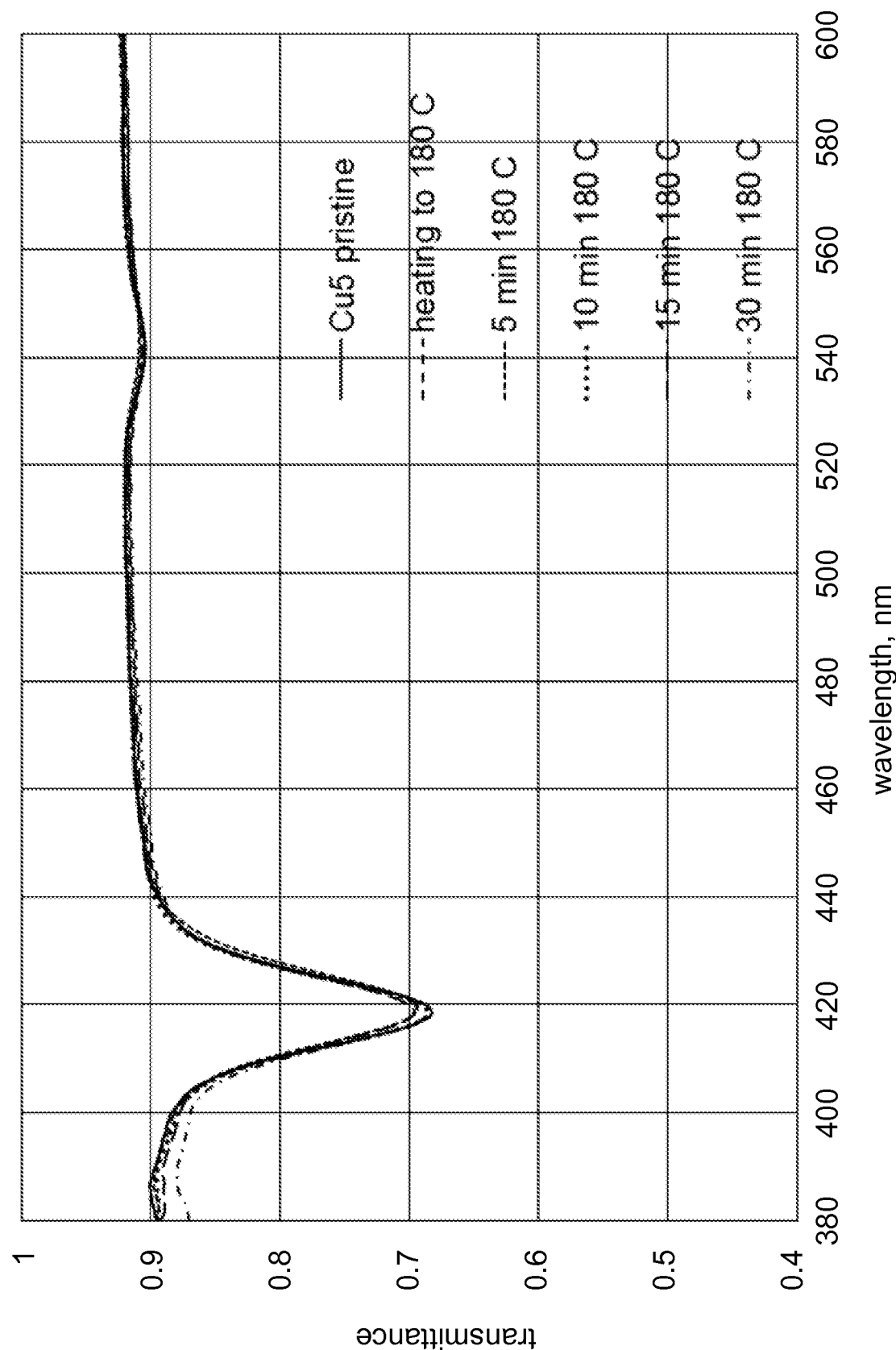
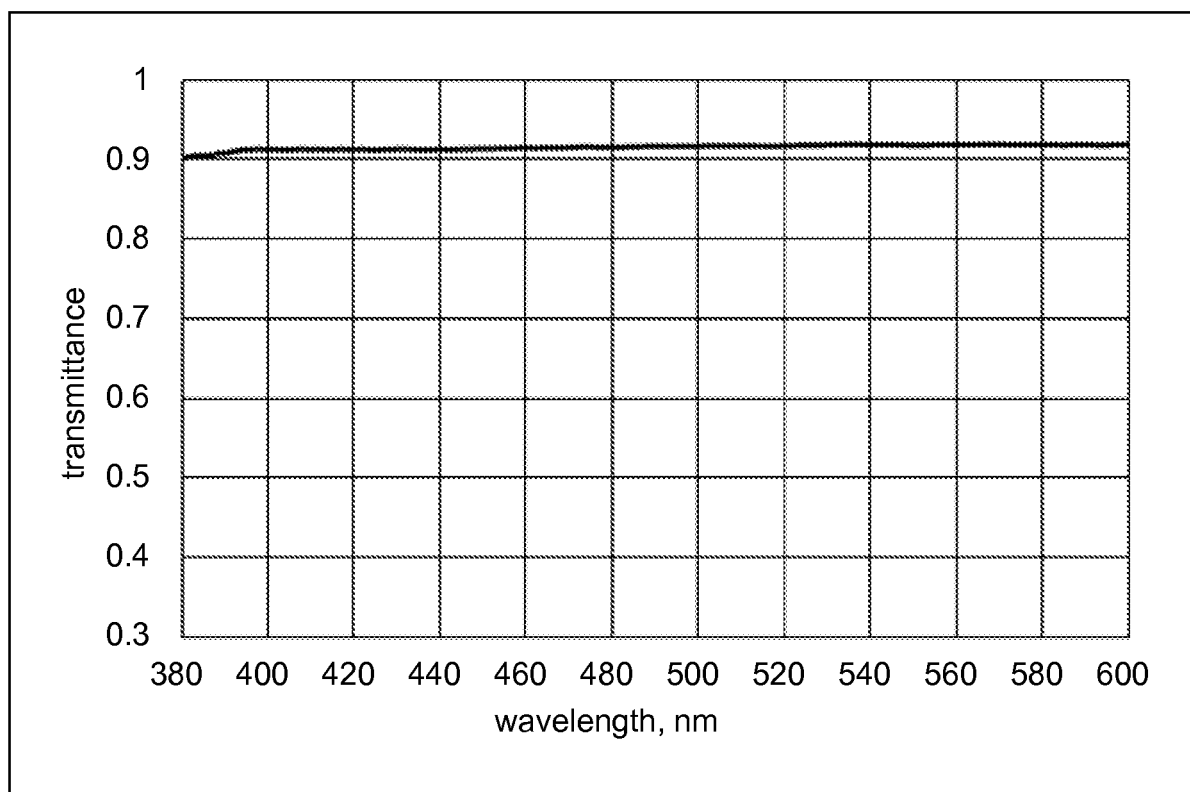
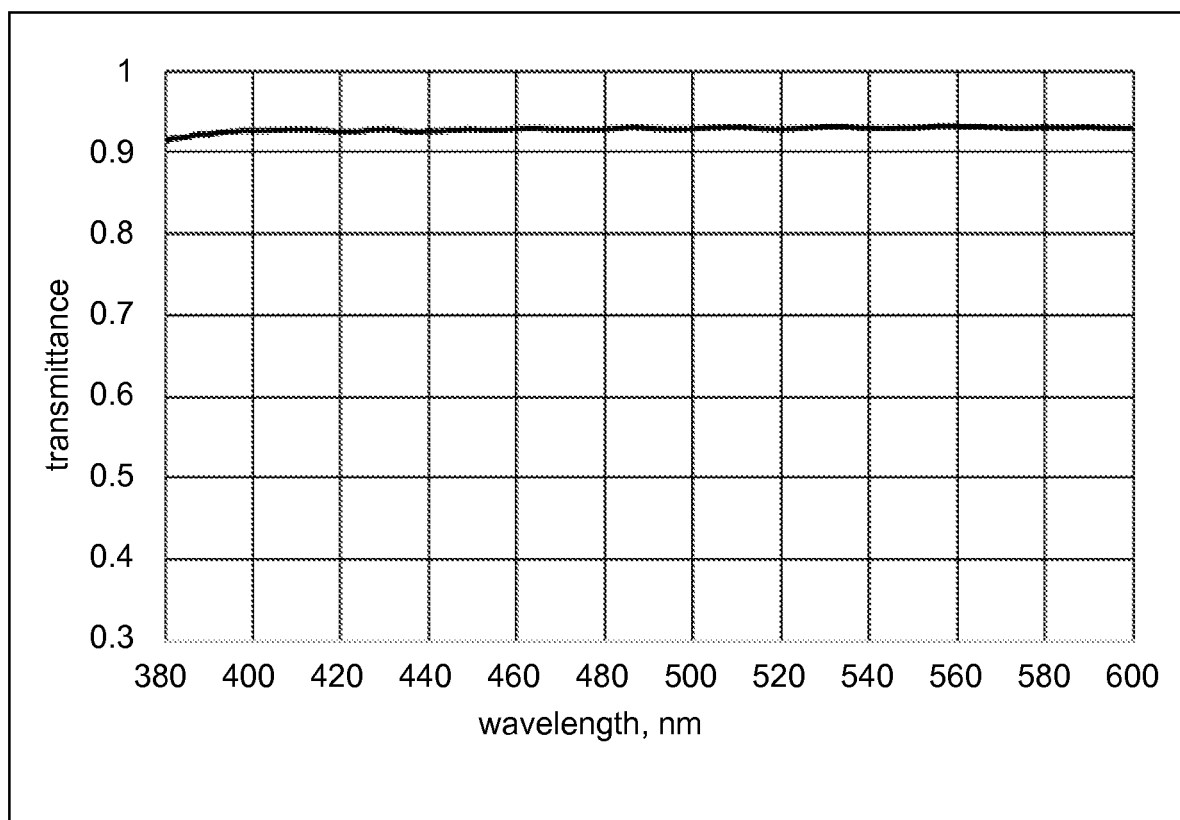
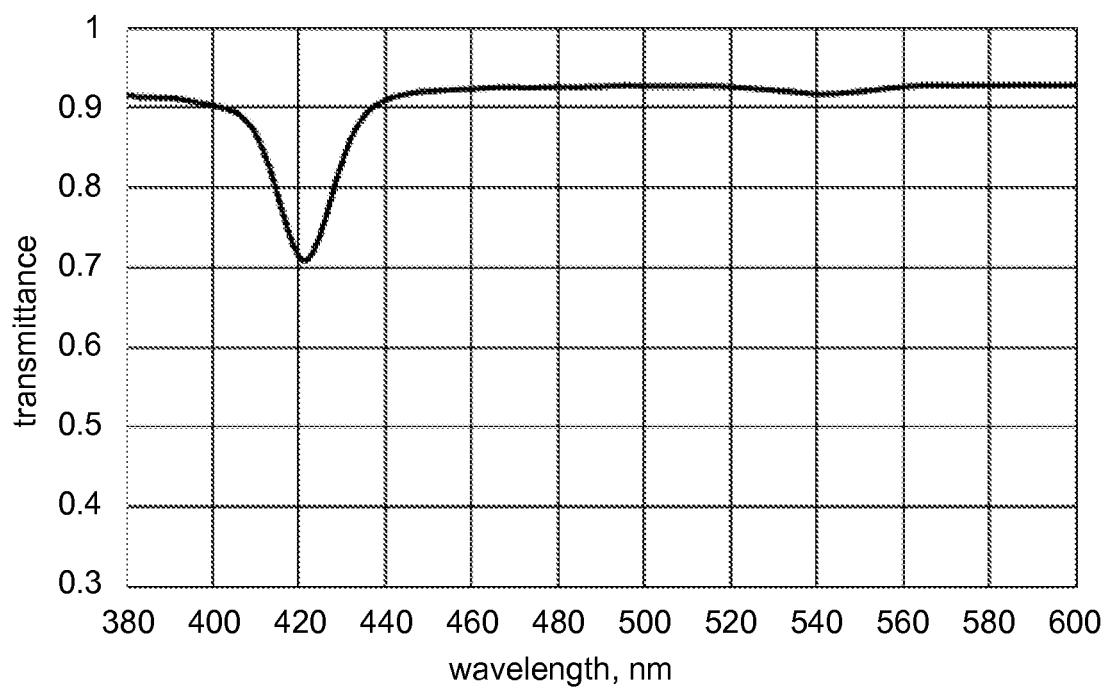
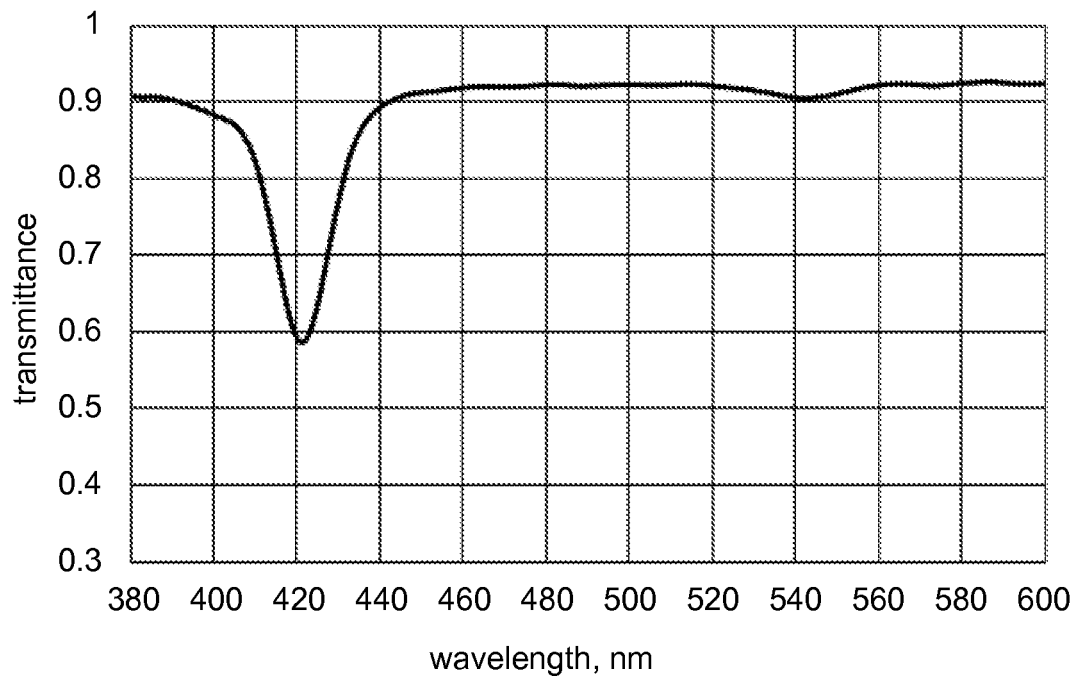
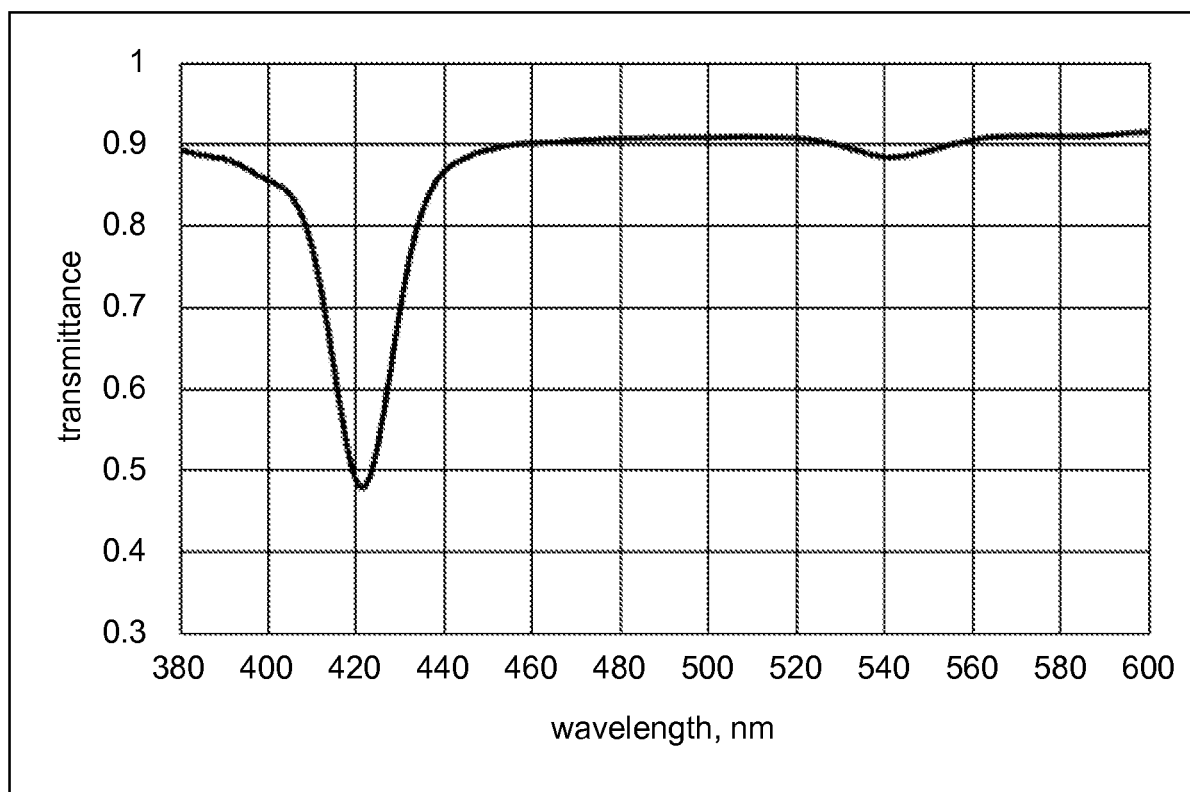


FIG. 50D

**FIG. 51****FIG. 52**

**FIG. 53****FIG. 54**

**FIG. 55**