

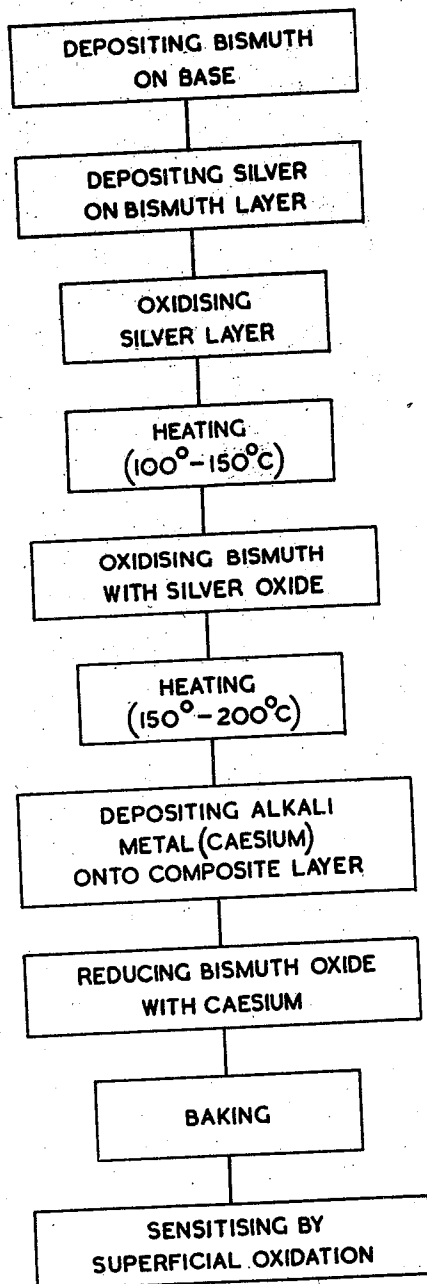
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PHOTO-ELECTRICALLY SENSITIVE ELECTRODE

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PHOTOELECTRICALLY SENSITIVE
ELECTRODE

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7 Claims. (Cl. 250—165)

This invention relates to improvements in photoelectrically sensitive surfaces, and is especially concerned with such a surface having a spectral sensitivity approximating to that of the human eye and with a method of manufacturing such a surface.

According to a feature of the present invention there is provided a photoelectrically sensitive surface comprising the elements bismuth, silver, an alkali metal and oxygen.

According to a further feature of the present invention a method of manufacturing a photoelectrically sensitive surface consists in depositing upon a supporting surface a layer of bismuth, depositing upon said bismuth layer a layer of silver, oxidising the silver, heating the composite bismuth-silver oxide layer, and finally depositing an alkali metal on said composite layer.

According to a further feature of the present invention, a method of manufacturing a photoelectrically sensitive surface consists in depositing upon a supporting surface a layer of bismuth, depositing upon said bismuth layer a layer of silver, oxidising the silver layer so that silver oxide is formed, heating the composite layer so that the silver oxide is reduced by the bismuth and bismuth oxide is formed, and finally depositing caesium on the said composite layer so that the bismuth oxide is reduced by the caesium.

A detailed description of one method of manufacturing a photoelectrically sensitive surface in accordance with the present invention will now be given.

The first step in the method consists in evaporating metallic bismuth on to a supporting layer which may comprise the glass wall of an evacuated envelope. Silver is then evaporated on to the bismuth layer and thereafter oxygen is admitted and silver is oxidised by discharge in known manner. The next step in the method consists in heating the bismuth-silver oxide layer to a temperature between 100° C. and 150° C. so that the following reaction occurs

Silver oxide + bismuth = bismuth oxide + silver
i. e., the silver oxide previously formed is reduced by the bismuth to leave bismuth oxide and silver. An alkali metal, for example caesium, is next evaporated on to the composite layer at a temperature between 150° C. and 200° C. so that the following reaction occurs

Bismuth oxide + caesium = caesium oxide + bismuth
i. e., bismuth oxide formed during the previous heating process is reduced to metallic bismuth. The two preceding steps of the process can be combined since the reaction between 100°

C. and 150° C. will be completed before the reaction between 150° C. and 200° C. commences. It is preferable that only sufficient caesium should be evaporated on to the composite layer to reduce all the bismuth oxide, for if an excess of caesium is evaporated this will form a compound with the metallic bismuth, which compound will have a deleterious effect on the photoelectric sensitivity of the layer to red light.

After the caesium has been evaporated on to the composite layer, the latter is baked and superficially oxidised until the highest total sensitivity or the desired spectral sensitivity is obtained.

It is found that by suitable adjustment of the amounts of the materials forming the composite layer produced by the method described above it is possible to produce a photoelectrically sensitive surface having a spectral sensitivity approximating to that of the human eye though this may be varied within limits by variations of the amounts of different substances present in the layer.

The drawing is a flow sheet of the processes described.

I claim:

1. A method of manufacturing a photoelectrically sensitive surface which consists in depositing upon a supporting surface a layer of bismuth, depositing upon said bismuth layer a layer of silver, oxidising the silver, heating the composite bismuth-silver oxide layer so that the bismuth is oxidized, and finally depositing an alkali metal on said composite layer so that the bismuth oxide is reduced to bismuth.

2. A method of manufacturing a photoelectrically sensitive surface which consists in depositing upon a supporting surface a layer of bismuth, depositing upon said bismuth layer a layer of silver, oxidising the silver layer, heating the bismuth-silver oxide layer so that the bismuth is oxidised, and finally depositing caesium on the composite layer so that the bismuth oxide is reduced to bismuth.

3. A method of manufacturing a photoelectrically sensitive surface which consists in depositing upon a supporting surface a layer of bismuth, depositing upon said bismuth layer a layer of silver, oxidising the silver layer so that silver oxide is formed, heating the composite layer so that the silver oxide is reduced by the bismuth and bismuth oxide is formed, and finally depositing caesium on the said composite layer so that the bismuth oxide is reduced by the caesium.

4. A method as claimed in claim 1, wherein

the composite bismuth-silver oxide layer is heated to a temperature between 100° and 150° C.

5. A method as claimed in claim 2, wherein the composite bismuth-silver oxide layer is heated to a temperature between 100° and 150° C.

6. A method as claimed in claim 1, wherein the composite layer after deposition of the alkali

metal is baked and superficially oxidised until an optimum photoelectric sensitivity is observed.

7. A method as claimed in claim 2, wherein the composite layer after deposition of the caesium is baked and superficially oxidised until an optimum photoelectric sensitivity is observed.

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