Claims

1. Method for treatment of a sulphide-containing spent caustic via chemical conversion of the sulphides, wherein the method is comprised of the following steps:

introducing the spent caustic into a reaction chamber (18) that is comprised of at least one acoustic power converter (22) and one cavitation element (20),

treating the spent caustic with ultrasound from the at least one acoustic power converter (22),

feeding a gas mixture containing ozone into the reaction chamber and distributing the gas mixture containing ozone in the spent caustic using the cavitation element (20),

wherein the sulphide-containing spent caustic is converted with the gas mixture containing ozone, forming non-sulphide-bearing, inorganic sulphur compounds.

2. Method according to claim 1, characterised in that a spent caustic with a pH value of between 8 and 14, preferably from 9 to 12, is used.

3. Method according to claim 1 or 2, characterised in that the ultrasonic treatment is carried out with 400 to 1500 kHz.

4. Method according to claims 1 to 3, characterised in that the sulphide-containing spent caustic is treated with ultrasound before the addition of the gas mixture containing ozone.

5. Method according to one of the claims 1 to 4, characterised in that the gas mixture containing ozone is an oxygen/ozone mixture.

6. Method according to one of the claims 1 to 5, characterised in that the sulphides are converted with ozone at 20 to 40° C.

7. Method according to one of the claims 1 to 6, characterised in that the temperature of the sulphide-containing spent caustic is measured and evaluated to control the quantity of ozone to be supplied to the spent caustic.

8. Method according to one of the claims 1 to 7, characterised in that the method is carried out in several reaction chambers arranged one behind the other.

9. Method according to one of the claims 1 to 8, characterised in that the ultrasonic treatment and the conversion with ozone are carried out at the ambient pressure.

10. Method according to one of the claims 1 to 9, characterised in that the gas mixture is discharged from the spent caustic with the sulphides after the conversion step and passed through one or more catalytic converters to break down unconverted ozone and/or to further oxidize compounds containing sulphur, especially hydrogen sulphide.

11. Method according to one of the preceding claims, characterised in that the spent caustic is caustic soda.

12. Method according to one of the preceding claims, characterised in that the non-sulphide-bearing, inorganic sulphur compounds are essentially sulphates.

13. Device for carrying out the method as per the invention with a feeder tank (10) for sulphide-containing spent caustic and a reaction chamber (18) connected in terms of flow with the feeder tank, wherein the reaction chamber includes at least one acoustic power converter (22) and a mechanical cavitation element (20) and wherein a supply unit (24) for gas containing ozone is provided in the reaction chamber, characterised in that the device further includes one or more temperature sensors (26) and a control unit (27) connected to the temperature sensor(s) (26) and the supply unit (24) for controlling the quantity of gas containing ozone that is supplied to the reaction chamber in dependence upon the temperature of the spent caustic.

CLAIMS

1. A method for treatment of a sulphide-containing spent caustic via chemical conversion of the sulphides, in which the method is comprised of the following steps:

introducing the spent caustic into a reaction chamber (18) that is comprised of at least one acoustic power converter (22) and one cavitation element (20),

treating the spent caustic with ultrasound from the at least one acoustic power converter (22),

feeding a gas mixture containing ozone into the reaction chamber and distributing the gas mixture containing ozone in the spent caustic using the cavitation element (20),

in which the sulphide-containing spent caustic is converted with the gas mixture containing ozone, forming non-sulphide-bearing, inorganic sulphur compounds, and

in which the temperature of the sulphide-containing spent caustic is measured and evaluated to control the quantity of ozone to be supplied to the spent caustic.

2. A method according to Claim 1, characterised in that a spent caustic with a pH value of between 8 and 14, preferably from 9 to 12, is used.

3. A method according to Claim 1 or 2, characterised in that the ultrasonic treatment is carried out with 400 to 1500 kHz.

4. A method according to Claim 1, 2 or 3, characterised in that the sulphide-containing spent caustic is treated with ultrasound before the addition of the gas mixture containing ozone.

5. A method according to any preceding claim, characterised in that the gas mixture containing ozone is an oxygen/ozone mixture.

6. A method according to any preceding claim, characterised in that the sulphides are converted with ozone at 20 to 40° C.

7. A method according to any preceding claim, characterised in that the method is carried out in several reaction chambers arranged one behind the other.

8. A method according to any preceding claim, characterised in that the ultrasonic treatment and the conversion with ozone are carried out at the ambient pressure.

9. A method according to any preceding claim, characterised in that the gas mixture is discharged from the spent caustic with the sulphides after the conversion step and passed through one or more catalytic converters to break down unconverted ozone and/or to further oxidize compounds containing sulphur, especially hydrogen sulphide.

10. A method according to any preceding claim, characterised in that the spent caustic is caustic soda.

11. A method according to any preceding claim, characterised in that the non-sulphide-bearing, inorganic sulphur compounds are essentially sulphates.

12. A device for carrying out the method as per the invention with a feeder tank (10) for sulphide-containing spent caustic and a reaction chamber (18) connected in terms of flow with the feeder tank, in which the reaction chamber includes at least one acoustic power converter (22) and a mechanical cavitation element (20) and in which a supply unit (24) for gas containing ozone is provided in the reaction chamber, characterised in that the device further includes one or more temperature sensors (26) and a control unit (27) connected to the temperature sensor(s) (26) and the supply unit (24) for controlling the quantity of gas containing ozone that is supplied to the reaction chamber in dependence upon the temperature of the spent caustic.