CLAIMS

1. An integrated process that operates within the battery limits of a refinery producing asphalt, coker oil and gas products, and petroleum green coke, the process comprising:

charging a feedstock to an oxidizing unit along with an effective quantity of oxidant to produce an intermediate charge containing oxidized organosulfur compounds;

passing the intermediate charge to a solvent deasphalting unit along with an effective quantity of solvent to produce a deasphalted/desulfurized oil phase and an asphalt phase containing oxidized organosulfur compounds; and

passing the deasphalted/desulfurized oil phase to a coker unit including a coker furnace and at least one coker drum to

produce liquid and gas coker products as an effluent stream and

recover petroleum green coke from the coker drum.

2. The process of claim 1 wherein the coker unit is a delayed coker unit.

3. The process of claim 2, wherein the coker unit is configured with two or more parallel drums and is operated in a swing mode, and wherein the process is continuous,

4. The process of claim 1 wherein the deasphalted/desulfurized oil phase contains less than 2.5 W% sulfur.

5. The process of claim 4, wherein the deasphalted/desulfurized oil phase contains less than 700 ppmw metal.

6. The process of claim 5, wherein the petroleum green coke recovered from the coker drum effective raw material for calcination into anode grade coke (sponge) or electrode grade coke (needle).

7. The process as in claim 1 in which the oxidizing unit is an asphalt oxidizer.

8. The process as in claim 1 wherein the intermediate charge contains oxidized organosulfur compounds and oxidized organonitrogen compounds.

9. The process as in claim 8 wherein the oxidized organosulfur compounds and oxidized organonitrogen compounds are insoluble in the solvent used in the solvent deasphalting unit and thereby shift to the asphalt phase.

10. The process as in claim 1 wherein the oxidizing unit is operated at an inlet temperature in the range of from 100 ï 300 ºC.

11. The process as in claim 1 wherein the oxidizing unit is operated at an inlet temperature in the range of from 150 ï 200 ºC.

12. The process as in claim 1 wherein the oxidizing unit is operated at a temperature in the range of from 150 ï 400 ºC.

13. The process as in claim 1 wherein the oxidizing unit is operated at a temperature in the range of from 250 ï 300 ºC.

14. The process as in claim 1 wherein the oxidizing unit is operated at a pressure in the range of from ambient to 60 bars.

15. The process as in claim 1 wherein the oxidizing unit is operated at a pressure in the range of from ambient to 30 bars.

16. The process as in claim 1, wherein the solvent is a C_3 to C_7 -paraffinic solvent.

17. The process as in claim 16, wherein the solvent deasphalting unit operates at a temperature and a pressure that are below critical pressure and temperature levels of the solvent.

18. The process as in claim 17, wherein the solvent is a mixture of C_4 -normal and iso-butane.

19. The process as in claim 16, wherein operations in the solvent deasphalting unit

include

mixing the intermediate charge and solvent with recycle solvent and optionally make-up solvent;

transferring the mixture to a primary settler in which a primary deasphalted/desulfurized oil phase and a primary asphalt phase are formed;

transferring the primary deasphalted/desulfurized oil phase to a secondary settler in which a secondary deasphalted/desulfurized oil phase and a secondary asphalt phase are formed;

recycling the secondary asphalt phase to the primary settler to recover additional deasphalted/desulfurized oil;

conveying the secondary deasphalted/desulfurized oil phase to a deasphalted/desulfurized oil separation zone to obtain a recycle solvent stream and a substantially solvent-free deasphalted/desulfurized oil phase stream;

conveying the primary asphalt phase is conveyed to a separator vessel for flash separation of an additional recycle solvent stream and a bottom asphalt phase,

wherein the substantially solvent-free deasphalted/desulfurized oil phase stream is the feed to the coker unit.

20. The process as in claim 1, wherein the deasphalted/desulfurized oil phase is solvent-soluble, and wherein the petroleum green coke has a sulfur content of no greater than 3.5 w%..