7. The process of any one of the preceding claims, wherein the cleavage reaction mixture contains at least 1 wt% more phenol than the weight percentage of cyclohexanone.

8. The process of any one of the preceding claims and further including (d) dividing said cleavage effluent into at least a cleavage product and a cleavage recycle, wherein said cleavage recycle provides at least a portion of said phenol, water, and sulfuric acid mixed with said cleavage feed in step (b).

9. The process of claim 8, wherein at least a portion of said water mixed with said cleavage feed in step (b) is provided by one or more of adding water to said cleavage feed, mixing said cleavage feed with said cleavage recycle and with water, adding water to said cleavage recycle, and adding water to said cleavage effluent.

10. The process of claim 8 or claim 9, wherein at least a portion of said sulfuric acid mixed with said cleavage feed in step (b) is provided by one or more of adding sulfuric acid to said cleavage feed, mixing said cleavage feed with said cleavage recycle and with sulfuric acid, adding sulfuric acid to said cleavage recycle, and adding sulfuric acid to said cleavage effluent.

11. The process of any one of claims 8 to 10, wherein at least a portion of said phenol mixed with said cleavage feed in step (b) is provided by one or more of adding phenol to said cleavage feed, mixing said cleavage feed with said cleavage recycle and with phenol, adding phenol to said cleavage recycle, and adding phenol to said cleavage effluent.

12. The process of any one of claims 8 to 11, wherein at least a portion of said cyclohexanone mixed with said cleavage feed in step (b) is provided by one or more of adding cyclohexanone to said cleavage feed, mixing said cleavage feed with said cleavage recycle and with cyclohexanone, adding cyclohexanone to said cleavage recycle, and adding cyclohexanone to said cleavage effluent.

13. A process for producing phenol and cyclohexanone, the process comprising:

(a) providing a cleavage feed containing cyclohexyl-1-phenyl-1-hydroperoxide;

(b) mixing said cleavage feed with at least water, phenol, and cyclohexanone to produce a cleavage reaction mixture; and

(c) reacting said cleavage reaction mixture in the presence of a sulfuric acid catalyst under conditions to maintain the weight ratio of phenol to cyclohexanone in said cleavage reaction mixture in excess of 1:1 and to convert part of said cyclohexyl-1-phenyl-1-hydroperoxide in said cleavage reaction mixture and produce a cleavage effluent containing phenol and cyclohexanone.

14. The process of claim 13, wherein said the weight ratio of phenol to cyclohexanone in said cleavage reaction mixture is from 1.05:1 to 10:1.

15. A process for producing phenol and cyclohexanone, the process comprising:

(a) hydroalkylating benzene with hydrogen in the presence of a first catalyst under conditions effective to produce a hydroalkylation product comprising cyclohexylbenzene;

(b) contacting at least part of said cyclohexylbenzene with an oxygen-containing compound in the presence of a second catalyst under oxidation conditions effective to produce an oxidation product comprising cyclohexyl-1-phenyl-1-hydroperoxide and unreacted cyclohexylbenzene;

(c) providing from said oxidation product a cleavage feed containing greater than 40 wt% and no greater than 95 wt% cyclohexyl-1-phenyl-1-hydroperoxide, and at least 5 wt% and less than 60 wt% cyclohexylbenzene;

(d) mixing said cleavage feed with at least phenol, cyclohexanone, water, and sulfuric acid, to produce a cleavage reaction mixture containing from 15 wt% to 50 wt% phenol, from 15 wt% to 50 wt% cyclohexanone, from 1 wt% to 10 wt% cyclohexyl-1-phenyl-1-hydroperoxide, from 5 wt% to 60 wt% cyclohexylbenzene, from 0.1 wt% to 4 wt% water, and from 10 wppm to 1000 wppm sulfuric acid; and

(e) reacting said cleavage reaction mixture at a temperature from 30°C and to 70°C for a time sufficient to convert at least 50% of said cyclohexyl-1-phenyl-1-hydroperoxide in said cleavage reaction mixture and produce a cleavage effluent containing phenol and cyclohexanone.

16. The process of claim 15, wherein said cleavage feed contains from 60 wt% to 85 wt% cyclohexyl-1-phenyl-1-hydroperoxide, and from 15 wt% to 40 wt% cyclohexylbenzene.