



(12) PATENT ABSTRACT

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- (54) COAL LIQUEFACTION  
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 (74) HA  
 (57) Claim

1. A process for upgrading coal which comprises the steps of: (1) subjecting a slurry composed of coal and a solvent containing donatable hydrogen, together with hydrogen, to catalyst-free hydrogenation conditions in a first hydrogenation zone to form an intermediate coal-solvent slurry; (2) deashing said intermediate coal-solvent slurry to form a coal-solvent solution; (3) subjecting said coal-solvent solution to catalytic hydrogenation conditions in a second hydrogenation zone to obtain a liquid product that can be separated at ambient pressure into (a) a first liquid fraction boiling at a temperature in the range of about 100 to about 375°C, (b) a second liquid fraction boiling above said first liquid fraction at a temperature in the range of about 200 to about 525°C and (c) a solid and/or semi-solid material and then (4) recycling at least a portion of said second liquid fraction to said first hydrogenation zone.