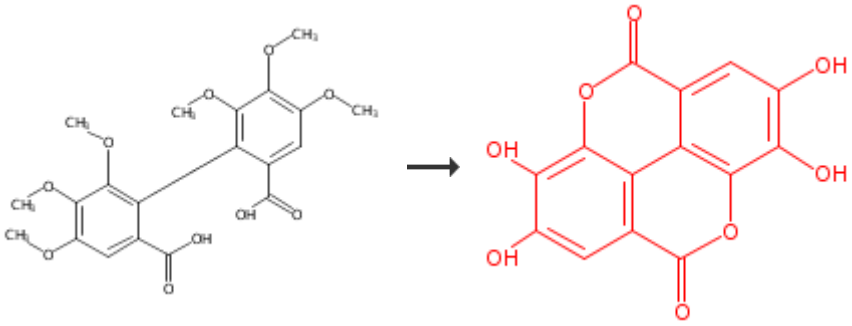
1. Single Step



100%

Overview

Steps/Stages

1.1 R:BBr_3, S:CH_2Cl_2, -40°C; -40°C → rt; 40 h, rt

Notes

Reactants: 1, Reagents: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Rhodium(I)-catalyzed regiospecific dimerization of aromatic acids: two direct C-H bond activations in water

By Gong, Hang et al

From Angewandte Chemie, International Edition, 54(19), 5718-5721; 2015

Reaction Protocol

Procedure

1. Add BBr_3 (2 mL, 21.5 mmol) dropwise to the solution of reactant (108 mg, 0.25 mmol) in 2 mL CH_2Cl_2 at -40 °C under argon.
2. Allow the mixture to slowly warm to room temperature.

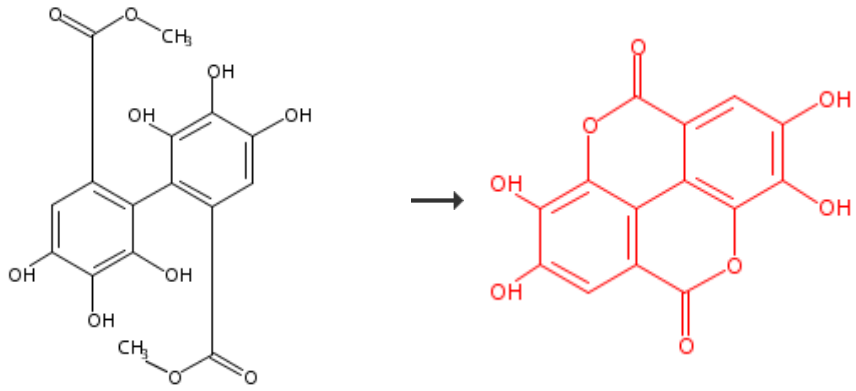
View more...

Available Experimental Data

^{1}H NMR, ^{13}C NMR, IR, HRMS, MP, State

View with MethodsNow

2. Single Step



100%

Overview

Steps/Stages

1.1 R:H_2O, S:H_2O, S:MeOH, 18 h, reflux

Notes

Reactants: 1, Reagents: 1, Solvents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

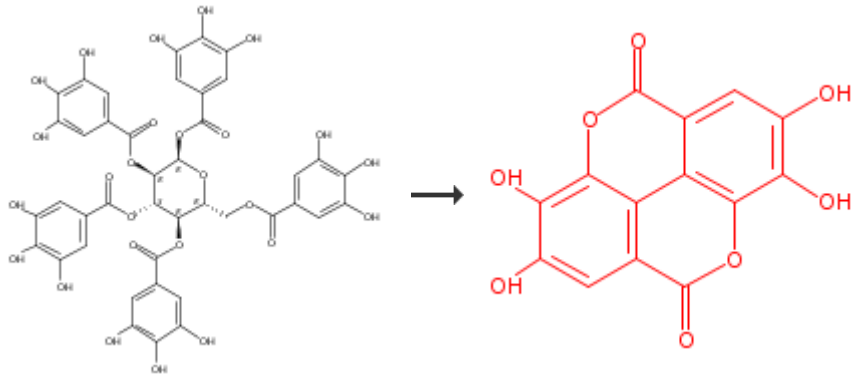
References

Synthesis of ellagic acid and its 4,4'-di-O-alky derivatives from gallic acid

By Alam, Ashraful et al

From Okayama Daigaku Kankyo Rikogakubu Kenkyu Hokoku, 10(1), 111-117; 2005

3. Single Step



50%

Overview

Steps/Stages

1.1 R:Disodium carbonate, S:H_2O, 70°C → rt; 6 h, rt

Notes

Reactants: 1, Reagents: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Synthesis and Antitumor Activity of Ellagic Acid Peracetate

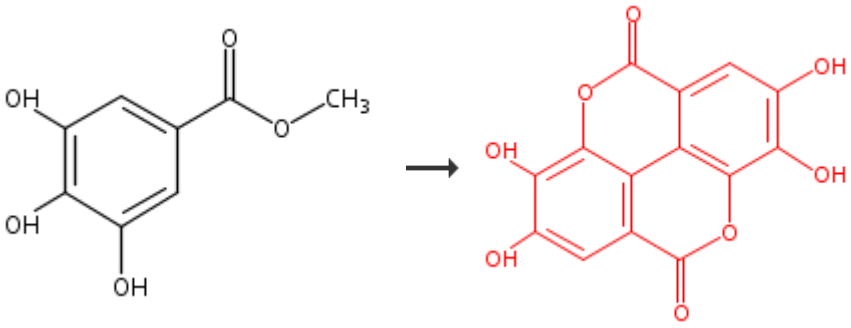
By Ren, Yulin et al

From ACS Medicinal Chemistry Letters, 3(8), 631-636; 2012

Experimental Procedure

Crystalline α-PGG (80 mg, 0.085 mM) was dissolved in 15 mL of 5% Na_2CO_3 solution at 70 °C and cooled to room temperature. The mixture was stirred at room temperature for 6 h and filtered. The solid product was washed with water and then MeOH, and re-crystallized in pyridine to give ellagic acid **1**. Amorphous white powder, yield 32 mg, 50%. ^{1}H NMR (300 MHz, DMSO-d_6) δ 7.57 (2H, s), 10.68 (4H, s). ^{13}C NMR (75.5 MHz, DMSO-d_6) δ 107.6, 110.2, 112.3, 136.4, 139.5, 148.1, 159.1. Positive ESIMS *m*/*z* 325.0 [M + Na]$^+$.

4. Single Step



Overview

Steps/Stages

1.1 R:$NaHCO_3$, R:O_2, S:H_2O, S:MeOH, 30°C

1.2 R:H_2SO_4, S:H_2O, 1 h

Notes

alternative prepn. shown, Reactants: 1, Reagents: 3, Solvents: 2, Steps: 1, Stages: 2, Most stages in any one step: 2

References

Preparation of ellagic acid from gallic acid esters

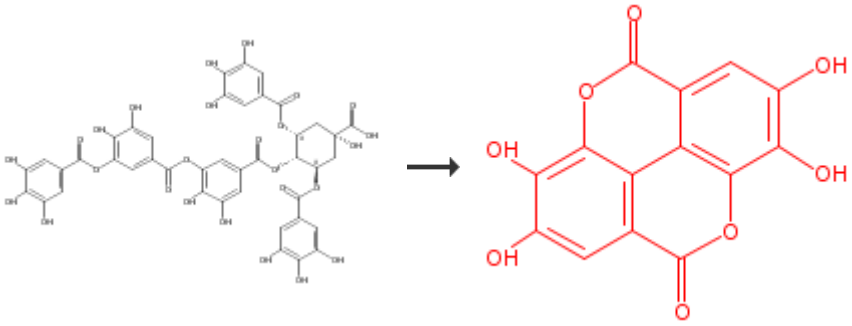
By Takahara, Jun and Hans, Rampars

From Jpn. Kokai Tokkyo Koho, 2004168688, 17 Jun 2004

Experimental Procedure

Example 1 8.5 g of sodium bicarbonate aqueous solution 200 ml was placed in a cylinder type reactor which was graduated cylinder with 35cm height and 3cm diameter, it was maintained at 30 °C while stirring with a magnetic stirrer. The nozzle which attached the glass filter (G4) to this previously was installed from the bottom to about 1 cm and bubbling of the air was carried out by the flow of 5 ml/m. Further methyl gallate 3.75 g was added to 20 ml of methanol and it was dissolved, the reaction was initiated. After the predetermined time mentioned later, stirred and circulation of air (21% of oxygen density) wasstopped and settled, green precipitate was obtained.This was filtered off, it was suspended for 1 hour in 10% sulfuric acid aqueous solution 200 ml, crude ellagic acid was obtained by filtration. [0028] After suspension for 1 hour in 5% aqueous sulfuric acid solution 200 ml this crude ellagic acid was filtered off.The filtered ellagic acid was washed until the wash liquid was pH7.In addition, this was suspended in 200 ml of water the suspension was washed and it was filtered off again.After drying for 3 hours at 60 °C under reduced pressure, the heat treatment was carried out at ordinary pressure at 150 °C for 1 hour and purified ellagic acid was obtained. When the reaction time was 3 hours the yield was 7.84%, 13.4% for 5 hours, 40.88% for 12 hours, 57.2% for 18 hours, 67% for 24 hours.If it was reacted for long time there was slight decrease was also observed, it was almost changeless, the final yield was 66%. the ratio over the amount of consumption oxygen of the amount of supply oxygen in each reaction time of this was 10.1 times, 9.90 times, 7.75 times, 8.33 times and 9.43 times.

5. Single Step



Overview

Steps/Stages

1.1 R:$K_2(S_2O_8)$, R:H_2SO_4, S:H_2O

Notes

Reactants: 1, Reagents: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Preparation of ellagic acid

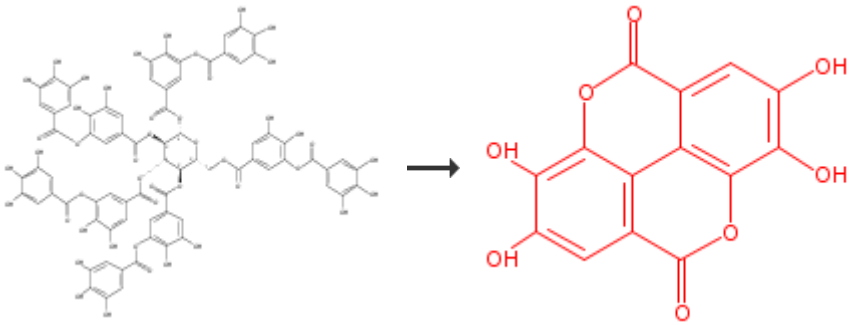
By Fukumoto, Yasuhiro et al

From Jpn. Kokai Tokkyo Koho, 2002205993, 23 Jul 2002

Experimental Procedure

Example 1. nutgall tannin 120g water 650g added stirred Gallnut tannin was completely dissolved. This to a solution 90g of concentrated sulfuric acid was added the acidic region and the entire reaction system, and the mixture was stirred by the addition of potassium persulfate further 80g. This solution heating the boiling temperature (100 .DEGREE CELSIUS. about) was allowed to react for 2 hours reflux is performed. The solution was cooled and the reaction was completed, was filtered using a (Made by Toyo Roshi No. 2) was filtered using. By drying using a vacuum desiccator filtration residue is washed with water well was filled with silica gel, ellagic acid 1.5g crude product was obtained. The crude product obtained ellagic acid 1.5g was dissolved in 30g of water stirred and 80 .DEGREE CELSIUS. was warmed. Here dry activated carbon 1.5g added, Further stirring for 20 minutes was continued. After cooling, filtration and washed with water and do, and dried under vacuum to the filtrate Refined product ellagic acid was obtained. The yield was 0.95g. [0014] Generated by the above ellagic acid, manufactured by Shimadzu Corporation (LC-10A model) High-performance liquid chromatography (hereinafter, referred to Britishand HPLC) In methanol: 0.1M-NaH_2PO_4 = 1:1 solution were analyzed by a conventional method using a mobile phase. Shown in Figure 1 and Figure 2 a chromatogram obtained by HPLC. Figure 1 shows the chromatogram of the crude product ellagic acid, Figure 2 is a chromatogram of ellagic acid purification products. According to the respective chromatogram, ellagic acid the peak that appeared near the retention time of 4 minutes. In addition, the purity of ellagic acid was calculated from the chromatogram, each crude product is about 94%, purified product was about 96%.

6. Single Step



Overview

Steps/Stages

1.1 R:$K_2(S_2O_8)$, R:H_2SO_4, S:H_2O

Notes

Reactants: 1, Reagents: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Preparation of ellagic acid

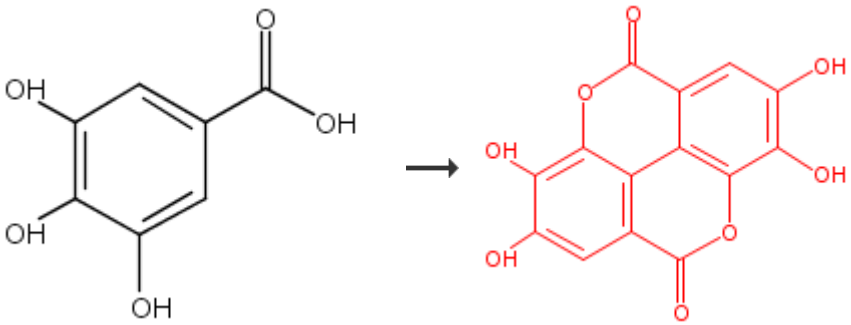
By Fukumoto, Yasuhiro et al

From Jpn. Kokai Tokkyo Koho, 2002205993, 23 Jul 2002

Experimental Procedure

General/Typical Procedure: Example 1. nutgall tannin 120g water 650g added stirred Gallnut tannin was completely dissolved. This to a solution 90g of concentrated sulfuric acid was added the acidic region and the entire reaction system, and the mixture was stirred by the addition of potassium persulfate further 80g. This solution heating the boiling temperature (100 .DEGREE CELSIUS. about) was allowed to react for 2 hours reflux is performed. The solution was cooled and the reaction was completed, was filtered using a (Made by Toyo Roshi No. 2) was filtered using. By drying using a vacuum desiccator filtration residue is washed with water well was filled with silica gel, ellagic acid 1.5g crude product was obtained. The crude product obtained ellagic acid 1.5g was dissolved in 30g of water stirred and 80 .DEGREE CELSIUS. was warmed. Here dry activated carbon 1.5g added, Further stirring for 20 minutes was continued. After cooling, filtration and washed with water and do, and dried under vacuum to the filtrate Refined product ellagic acid was obtained. The yield was 0.95g. [0015] tara tannin 120g Stirred with the addition of 99% 1L in acetic acid. Tara tannin was dissolved. This solution 90g of concentrated sulfuric acid was dropwise added, and the mixture was stirred by the addition 80g of potassium persulfate further added. This solution Was allowed to react for 2 hours at boiling temperature performed by heating to reflux. The reaction solution was terminated 2L of water was added. After cooling the aqueous solution, filter paper (No.2 manufactured by Toyo Roshi) was using filtered. After this, by treating in the same manner as in Example 1 filtration residue, 5.3g crude product ellagic acid was obtained. The crude product obtained ellagic acid 5.3g, the same manner as in Example 1 percentage of refining operation conditions was carried out. Refined product ellagic acid 3.9g was obtained.

7. Single Step



30%

Overview

Steps/Stages

Notes

1.1 R:$K_2(S_2O_8)$, R:H_2SO_4, S:H_2O, -50°C → -4°C

literature preparation, Reactants: 1, Reagents: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

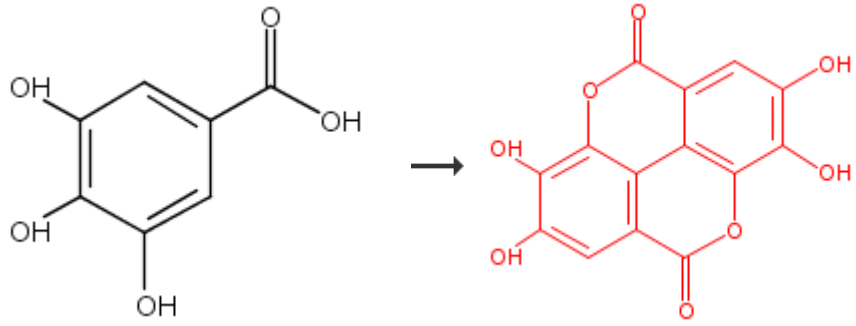
References

Enhancing autophagy or increasing longevity by administration of urolithins or precursors thereof

By Rinsch, Christopher L. et al

From PCT Int. Appl., 2014004902, 03 Jan 2014

8. Single Step



dimers dimers

Overview

Steps/Stages

1.1 R:Na_2HPO_4, C:9059-11-4, S:MeOH, S:H_2O, rt, pH 4

Notes

biotransformation, buffered solution, enzymic, Reactants: 1, Reagents: 1, Catalysts: 1, Solvents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

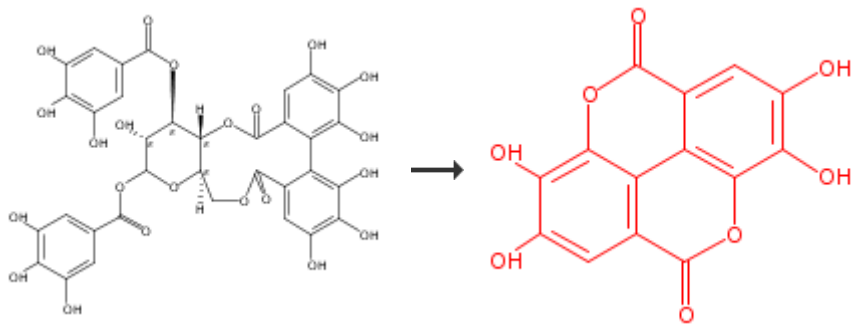
References

Method for the manufacture of dyes for use especially in the food or cosmetic industry, and dyes obtained with the method

By Curir, Paolo

From Ital. Appl., 91TO0175, 14 Sep 1992

9. Single Step



Overview

Steps/Stages

1.1

Notes

Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

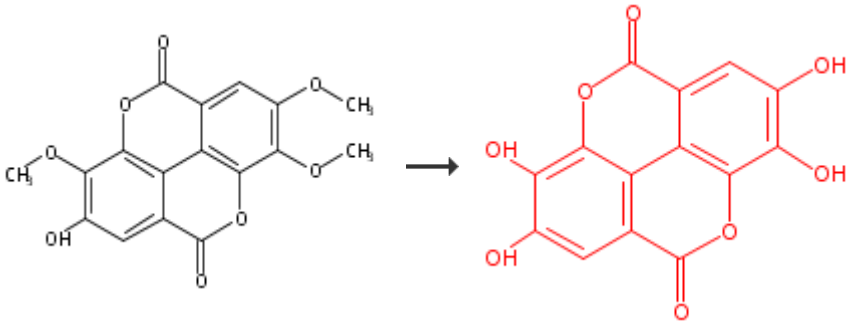
References

Heterophylliins A,B,C,D and E, ellagitannin monomers and dimers from Corylus heterophylla Fisch

By Yoshida, Takashi et al

From Chemical & Pharmaceutical Bulletin, 39(1), 49-54; 1991

10. Single Step



derivs.

Overview

Steps/Stages

1.1

Notes

Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

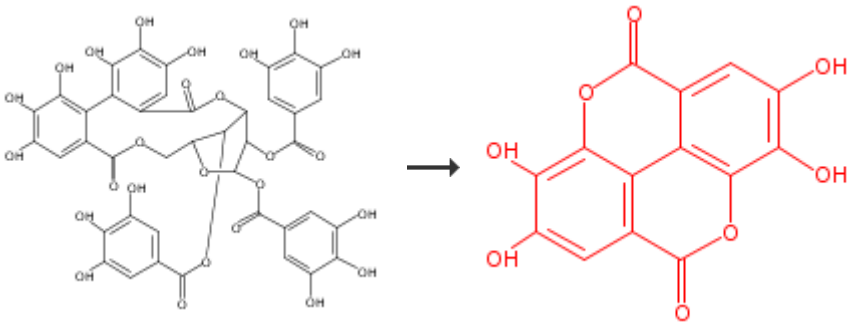
References

Ellagic compounds from Diplopanax stachyanthus

By Duc Do Khac et al

From Phytochemistry, 29(1), 251-6; 1990

11. Single Step



Overview

Steps/Stages

1.1

Notes

Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

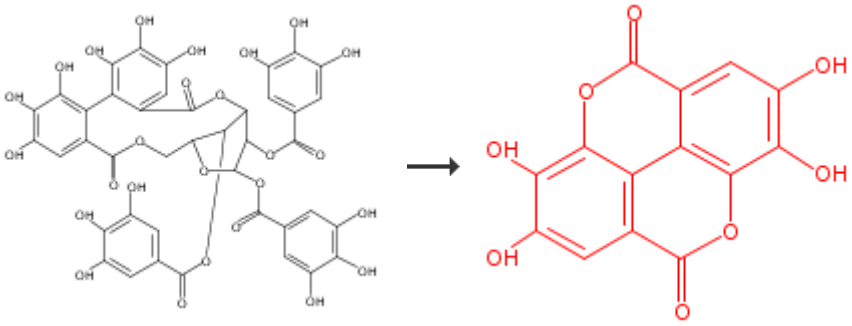
References

Tannins and related compounds. LXXV. Isolation and characterization of novel diastereoisomeric ellagitannins, nupharins A and B, and their homologs from Nuphar japonicum DC

By Ishimatsu, Makoto et al

From Chemical & Pharmaceutical Bulletin, 37(1), 129-34; 1989

12. Single Step



Overview

Steps/Stages

Notes

1.1

Reactants: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

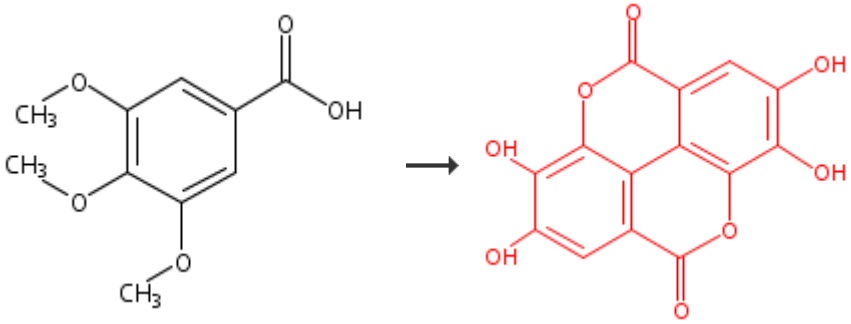
References

Tannins and related compounds. LXXV. Isolation and characterization of novel diastereoisomeric ellagitannins, nupharins A and B, and their homologs from Nuphar japonicum DC

By Ishimatsu, Makoto et al

From Chemical & Pharmaceutical Bulletin, 37(1), 129-34; 1989

13. 2 Steps



Overview

Steps/Stages

1.1 C:12257-42-0, C:MnO_2, S:H_2O, 72 h, 150°C; 150°C → rt

1.2 R:HCl, S:H_2O, pH 3

2.1 R:BBr_3, S:CH_2Cl_2, -40°C; -40°C → rt; 40 h, rt

Notes

1) green chemistry, regioselective, sealed tube used, Reactants: 1, Reagents: 2, Catalysts: 2, Solvents: 2, Steps: 2, Stages: 3, Most stages in any one step: 2

References

Rhodium(I)-catalyzed regiospecific dimerization of aromatic acids: two direct C-H bond activations in water

By Gong, Hang et al

From Angewandte Chemie, International Edition, 54(19), 5718-5721; 2015

Reaction Protocol

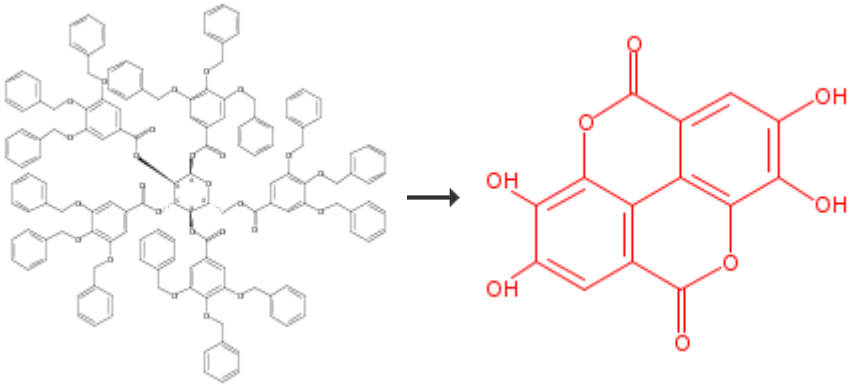
Procedure 1. Stir a solution of aromatic acid (0.2 mmol), [{Rh(nbd)Cl}$_2$] (4.6 mg, 0.01 mmol) and activated MnO_2 in distilled water (0.5 mL) in a sealed tube under an atmosphere of air at 150 °C for 24 hours.
2. Cool the reaction mixture to room temperature.

View more...

Available Experimental Data ^{1}H NMR, ^{13}C NMR, IR, HRMS, MP, State

View with MethodsNow

14. 2 Steps



Overview

Steps/Stages

1.1 R:H_2, C:Pd, S:THF, 16 h, 40°C

2.1 R:Disodium carbonate, S:H_2O, 70°C → rt; 6 h, rt

Notes

Reactants: 1, Reagents: 2, Catalysts: 1, Solvents: 2, Steps: 2, Stages: 2, Most stages in any one step: 1

References

Synthesis and Antitumor Activity of Ellagic Acid Peracetate

By Ren, Yulin et al

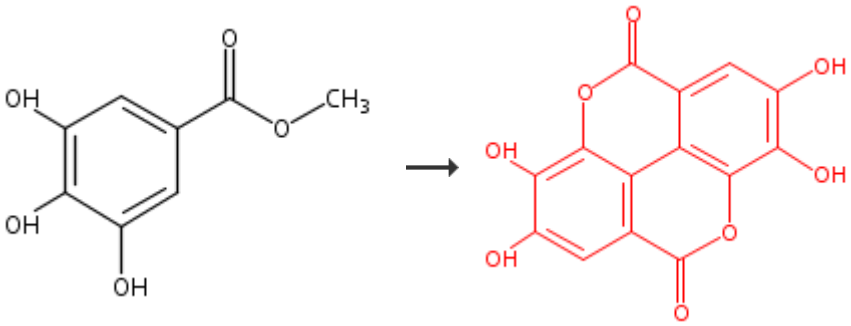
From ACS Medicinal Chemistry Letters, 3(8), 631-636; 2012

Experimental Procedure

Step 1
A suspension of 332 mg (0.145 mmol) of α-D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate] and 31.8 mg (0.30 mmol) of palladium (10 wt % on activated carbon) in 30 mL of dry THF was stirred at 40 °C under a hydrogen gas atmosphere for 16 h. The reaction mixture was cooled and filtered through Celite®, and the filtrate was evaporated. The residue was re-crystallized from water and α-D-glucopyranose pentakis(3,4,5-trihydroxybenzoate) was obtained α-D-glucopyranose pentakis(3,4,5-trihydroxybenzoate) (α-PGG), yield 85.0 mg, 62.2%.

Step 2
Crystalline α-PGG (80 mg, 0.085 mM) was dissolved in 15 mL of 5% Na_2CO_3 solution at 70 °C and cooled to room temperature. The mixture was stirred at room temperature for 6 h and filtered. The solid product was washed with water and then MeOH, and re-crystallized in pyridine to give ellagic acid **1**. Amorphous white powder, yield 32 mg, 50%. ^{1}H NMR (300 MHz, DMSO-d_6) δ 7.57 (2H, s), 10.68 (4H, s). ^{13}C NMR (75.5 MHz, DMSO-d_6) δ 107.6, 110.2, 112.3, 136.4, 139.5, 148.1, 159.1. Positive ESIMS *m*/*z* 325.0 $[M + Na]^+$.

15. 2 Steps



Overview

Steps/Stages

1.1 R:*o*-Chloranil, S:Et_2O, -40°C; 2 h, -40°C → rt; 1 h, rt

1.2 R:$Na_2(S_2O_4)$, S:THF, 0°C; 30 min, rt

2.1 R:H_2O, S:H_2O, S:MeOH, 18 h, reflux

Notes

Reactants: 1, Reagents: 3, Solvents: 4, Steps: 2, Stages: 3, Most stages in any one step: 2

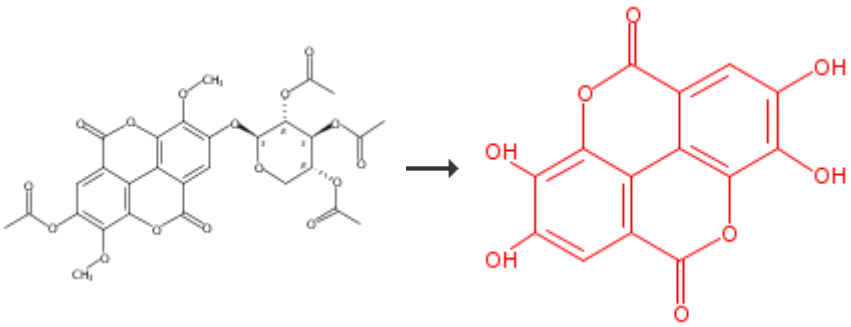
References

Synthesis of ellagic acid and its 4,4'-di-O-alky derivatives from gallic acid

By Alam, Ashraful et al

From Okayama Daigaku Kankyo Rikogakubu Kenkyu Hokoku, 10(1), 111-117; 2005

16. 2 Steps



derivs.

Overview

Steps/Stages

1.1

2.1

Notes

Reactants: 1, Steps: 2, Stages: 2, Most stages in any one step: 1

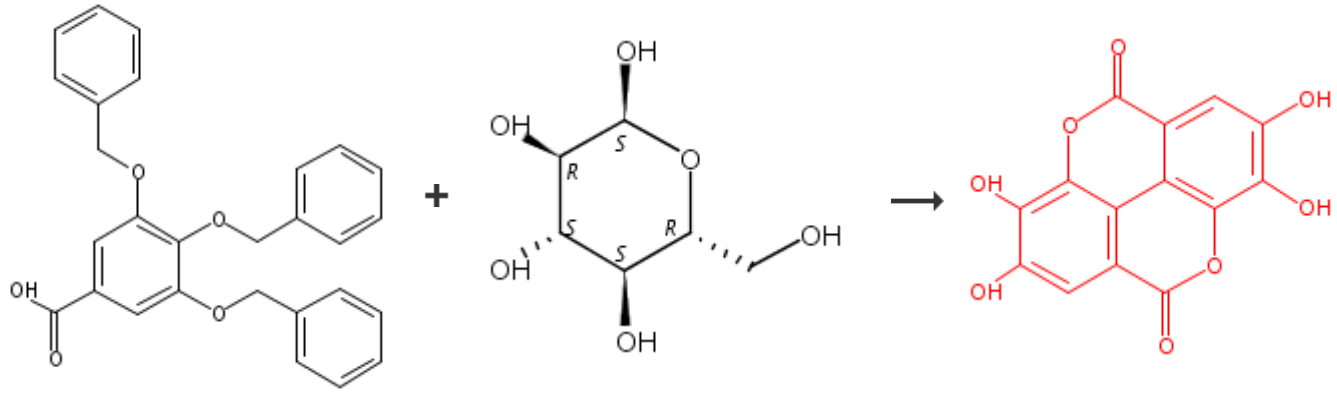
References

Ellagic compounds from Diplopanax stachyanthus

By Duc Do Khac et al

From Phytochemistry, 29(1), 251-6; 1990

17. 3 Steps



Overview

Steps/Stages

1.1 R:4-DMAP, R:DCC, S:CH_2Cl_2, 18 h, reflux

2.1 R:H_2, C:Pd, S:THF, 16 h, 40°C

3.1 R:Disodium carbonate, S:H_2O, 70°C → rt; 6 h, rt

Notes

Reactants: 2, Reagents: 4, Catalysts: 1, Solvents: 3, Steps: 3, Stages: 3, Most stages in any one step: 1

References

Synthesis and Antitumor Activity of Ellagic Acid Peracetate

By Ren, Yulin et al

From ACS Medicinal Chemistry Letters, 3(8), 631-636; 2012

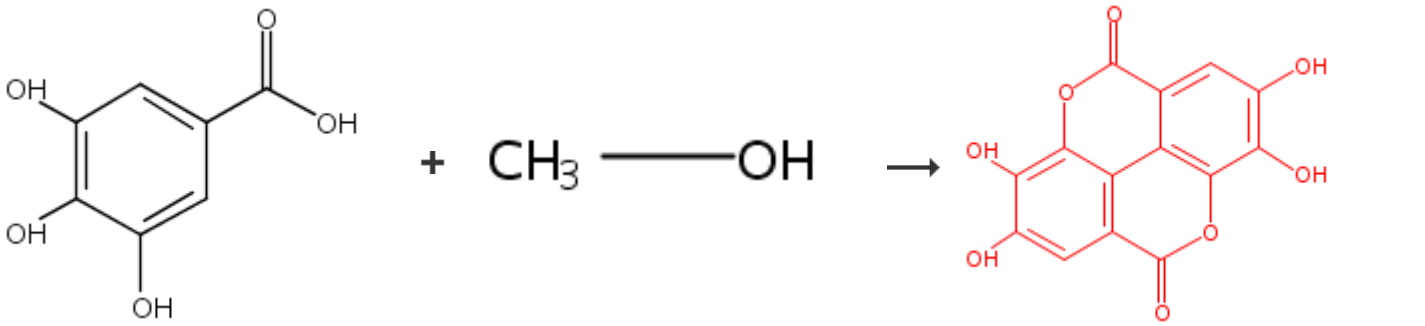
Experimental Procedure

Step 1
A suspension of 0.21 g (1.17 mmol) of D-glucose, 3.77 g (8.57 mmol) of 3,4,5-tribenzyloxybenzoic acid, 2.2 g (10.68 mmol) of dicyclohexylcarbodiimide (DCC), and 1.2 g (9.84 mmol) of *N*,*N*-(dimethylamino)pyridine (DMAP) in 135 mL of dry dichloromethane was refluxed for 18 h. After the mixture was cooled to room temperature, the urea byproduct was filtered and the filtrate was evaporated. The resulting residue was purified by column chromatography on silica gel, using a 75:25:1 mixture of dichloromethane, toluene, and ethyl acetate as the eluent. After evaporation, the residue of the product fraction was precipitated from toluene, and α -and β -D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate] were obtained. α -D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate], yield (337 mg); β -D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate], yield (319 mg).

Step 2
A suspension of 332 mg (0.145 mmol) of α-D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate] and 31.8 mg (0.30 mmol) of palladium (10 wt % on activated carbon) in 30 mL of dry THF was stirred at 40 °C under a hydrogen gas atmosphere for 16 h. The reaction mixture was cooled and filtered through Celite®, and the filtrate was evaporated. The residue was re-crystallized from water and α-D-glucopyranose pentakis(3,4,5-trihydroxybenzoate) was obtained α-D-glucopyranose pentakis(3,4,5-trihydroxybenzoate) (α-PGG), yield 85.0 mg, 62.2%.

Step 3
Crystalline α-PGG (80 mg, 0.085 mM) was dissolved in 15 mL of 5% Na_2CO_3 solution at 70 °C and cooled to room temperature. The mixture was stirred at room temperature for 6 h and filtered. The solid product was washed with water and then MeOH, and re-crystallized in pyridine to give ellagic acid **1**. Amorphous white powder, yield 32 mg, 50%. ^{1}H NMR (300 MHz, DMSO-d_6) δ 7.57 (2H, s), 10.68 (4H, s). ^{13}C NMR (75.5 MHz, DMSO-d_6) δ 107.6, 110.2, 112.3, 136.4, 139.5, 148.1, 159.1. Positive ESIMS *m*/*z* 325.0 [M + Na]$^+$.

18. 3 Steps



Overview

Steps/Stages

1.1 R:H_2SO_4, S:MeOH, 6-8 h, reflux

2.1 R:*o*-Chloranil, S:Et_2O, -40°C; 2 h, -40°C → rt; 1 h, rt

2.2 R:$Na_2(S_2O_4)$, S:THF, 0°C; 30 min, rt

3.1 R:H_2O, S:H_2O, S:MeOH, 18 h, reflux

Notes

Reactants: 2, Reagents: 4, Solvents: 4, Steps: 3, Stages: 4, Most stages in any one step: 2

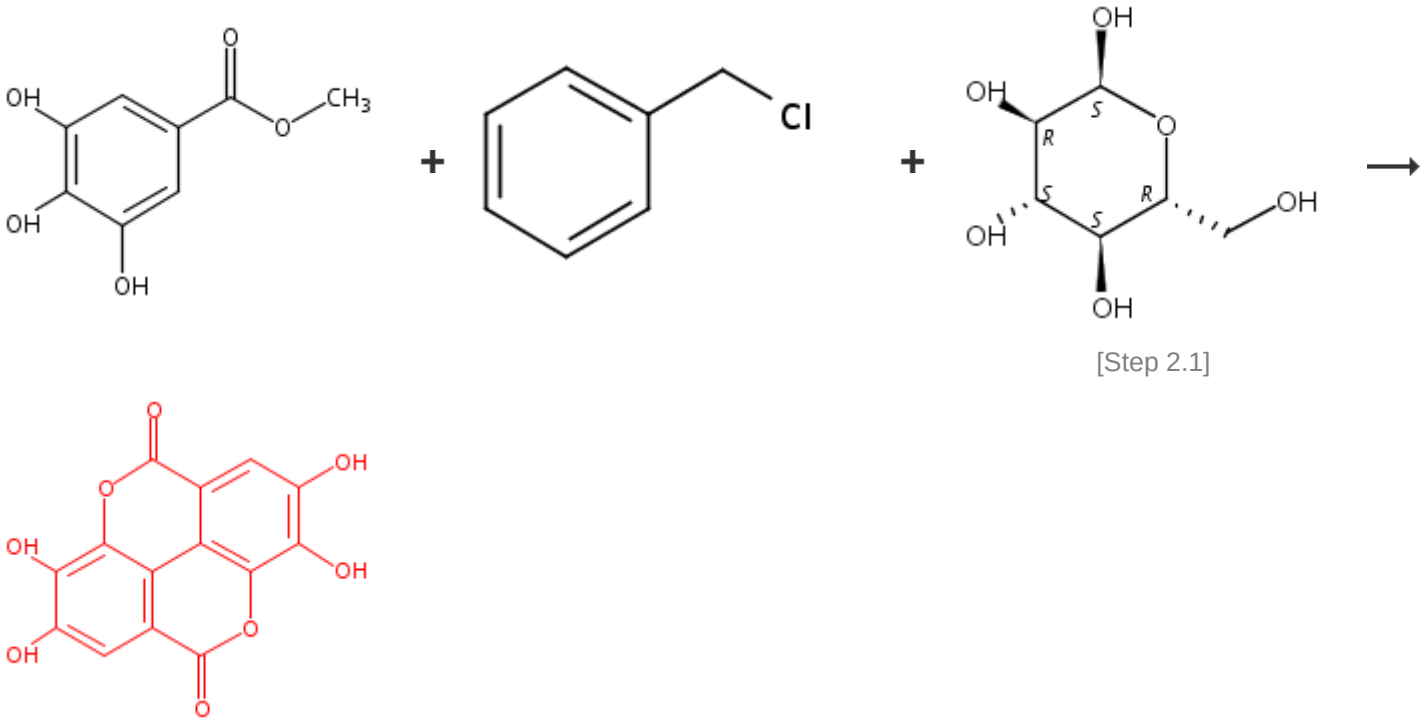
References

Synthesis of ellagic acid and its 4,4'-di-O-alky derivatives from gallic acid

By Alam, Ashraful et al

From Okayama Daigaku Kankyo Rikogakubu Kenkyu Hokoku, 10(1), 111-117; 2005

19. 4 Steps



[Step 2.1]

Overview

Steps/Stages

Notes

1.1 R:K_2CO_3, R:KI, S:Me_2CO, 20 min, rt
1.2 S:Me_2CO, 18 h, reflux

1.3 R:NaOH, S:H_2O, S:EtOH, 2 h, reflux

2.1 R:4-DMAP, R:DCC, S:CH_2Cl_2, 18 h, reflux

3.1 R:H_2, C:Pd, S:THF, 16 h, 40°C

4.1 R:Disodium carbonate, S:H_2O, 70°C → rt; 6 h, rt

Reactants: 3, Reagents: 7, Catalysts: 1, Solvents: 5, Steps: 4, Stages: 6, Most stages in any one step: 3

References

Synthesis and Antitumor Activity of Ellagic Acid Peracetate

By Ren, Yulin et al

From ACS Medicinal Chemistry Letters, 3(8), 631-636; 2012

Experimental Procedure

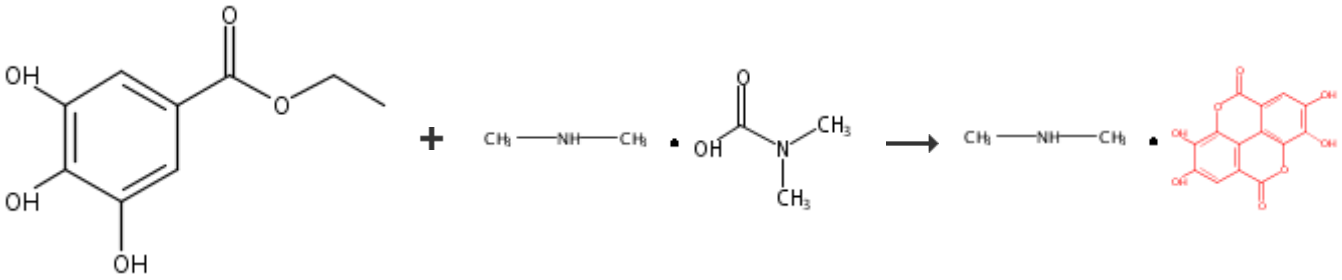
Step 1
A mixture of 10 g (54.3 mmol) of methyl 3,4,5-trihydroxybenzoate, 4 g (24 mmol) of potassium iodide, and 44 g (318 mmol) of anhydrous powdered potassium carbonate in 500 mL of acetone was stirred at room temperature for 20 min. Then, 22 g (174 mmol) of benzyl chloride dissolved in 100 mL of acetone were added. The suspension was refluxed for 18 h, and the solid was filtered. The filtrate was evaporated, and the residue was taken up in 400 mL of dichloromethane. The suspension was filtered through Celite, and again the filtrate was evaporated. After the residue was dried for 1 h under a vacuum, methyl 3,4,5-tribenzyloxybenzoate was obtained and used for the next step without further purification. Crude methyl 3,4,5-tribenzyloxybenzoate (26.52 g) was suspended in 500 mL of 95% ethanol. An amount of 3.54 g (88.5 mmol) of sodium hydroxide was added. After the mixture was refluxed for 2 h, the hot solution was poured into 525 mL of 0.6 M hydrochloric acid. A thick, voluminous suspension formed. The solid was filtered off, washed successively with 95% ethanol-water (1:1), water, 95% ethanol, methanol, and *tert*-butyl methyl ether, and dried overnight under vacuum to give 3,4,5-tribenzyloxybenzoic acid. Yield (22.6 g, 94%).

Step 2
A suspension of 0.21 g (1.17 mmol) of D-glucose, 3.77 g (8.57 mmol) of 3,4,5-tribenzyloxybenzoic acid, 2.2 g (10.68 mmol) of dicyclohexylcarbodiimide (DCC), and 1.2 g (9.84 mmol) of *N*,*N*-(dimethylamino)pyridine (DMAP) in 135 mL of dry dichloromethane was refluxed for 18 h. After the mixture was cooled to room temperature, the urea byproduct was filtered and the filtrate was evaporated. The resulting residue was purified by column chromatography on silica gel, using a 75:25:1 mixture of dichloromethane, toluene, and ethyl acetate as the eluent. After evaporation, the residue of the product fraction was precipitated from toluene, and α -and β -D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate] were obtained. α -D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate], yield (337 mg); β -D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate], yield (319 mg).

Step 3
A suspension of 332 mg (0.145 mmol) of α-D-glucopyranose pentakis[3,4,5-tris(phenylmethoxy)benzoate] and 31.8 mg (0.30 mmol) of palladium (10 wt % on activated carbon) in 30 mL of dry THF was stirred at 40 °C under a hydrogen gas atmosphere for 16 h. The reaction mixture was cooled and filtered through Celite®, and the filtrate was evaporated. The residue was re-crystallized from water and α-D-glucopyranose pentakis(3,4,5-trihydroxybenzoate) was obtained α-D-glucopyranose pentakis(3,4,5-trihydroxybenzoate) (α-PGG), yield 85.0 mg, 62.2%.

Step 4
Crystalline α-PGG (80 mg, 0.085 mM) was dissolved in 15 mL of 5% Na_2CO_3 solution at 70 °C and cooled to room temperature. The mixture was stirred at room temperature for 6 h and filtered. The solid product was washed with water and then MeOH, and re-crystallized in pyridine to give ellagic acid **1**. Amorphous white powder, yield 32 mg, 50%. ^{1}H NMR (300 MHz, DMSO-d_6) δ 7.57 (2H, s), 10.68 (4H, s). ^{13}C NMR (75.5 MHz, DMSO-d_6) δ 107.6, 110.2, 112.3, 136.4, 139.5, 148.1, 159.1. Positive ESIMS *m*/*z* 325.0 $[M + Na]^+$.

20. Single Step



70%

Overview

Steps/Stages

1.1 R:H_2O, S:4137-10-4, 5 h, rt

1.2 R:H_2O, overnight, rt

Notes

ionic liquid used (solvent), Reactants: 2, Reagents: 1, Solvents: 1, Steps: 1, Stages: 2, Most stages in any one step: 2

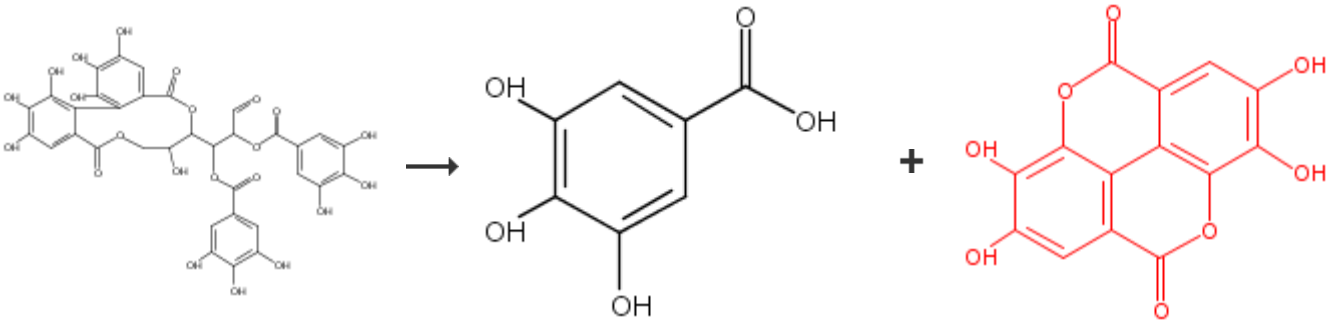
References

Efficient Synthesis of Ellagic Acid Salts Using Distillable Ionic Liquids

By Chowdhury, Shahana A. et al

From Australian Journal of Chemistry, 64(12), 1624-1627; 2011

21. Single Step



Overview

Steps/Stages

1.1 S:H_2O

Notes

biotransformation, enzymic, Aspergillus flavus tannase used as catalyst, other product also detected (glucose), Reactants: 1, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

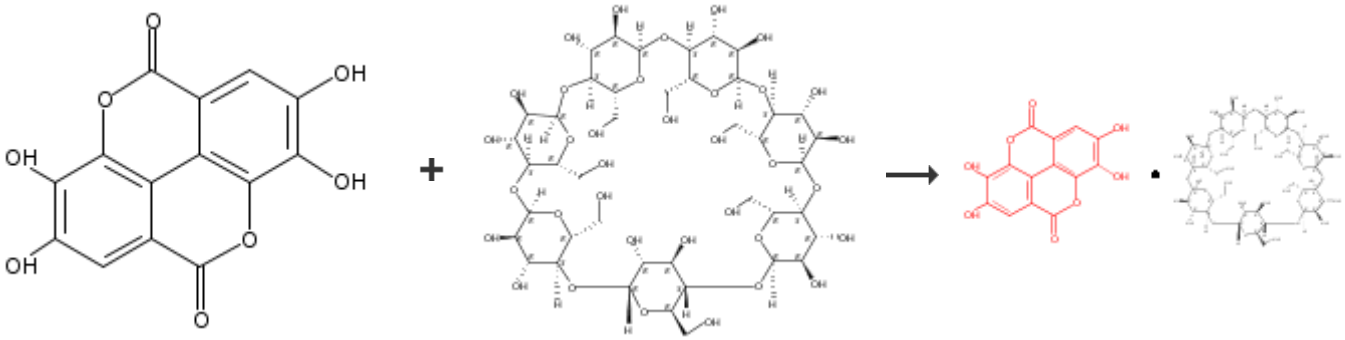
References

Aflatoxigenesis induced in Aspergillus flavus by oxidative stress and reduction by phenolic antioxidants from tree nuts

By Mahoney, N. et al

From World Mycotoxin Journal, 3(1), 49-57; 2010

22. Single Step



Overview

Steps/Stages

1.1 S:H_2O, 24 h, rt

Notes

Reactants: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

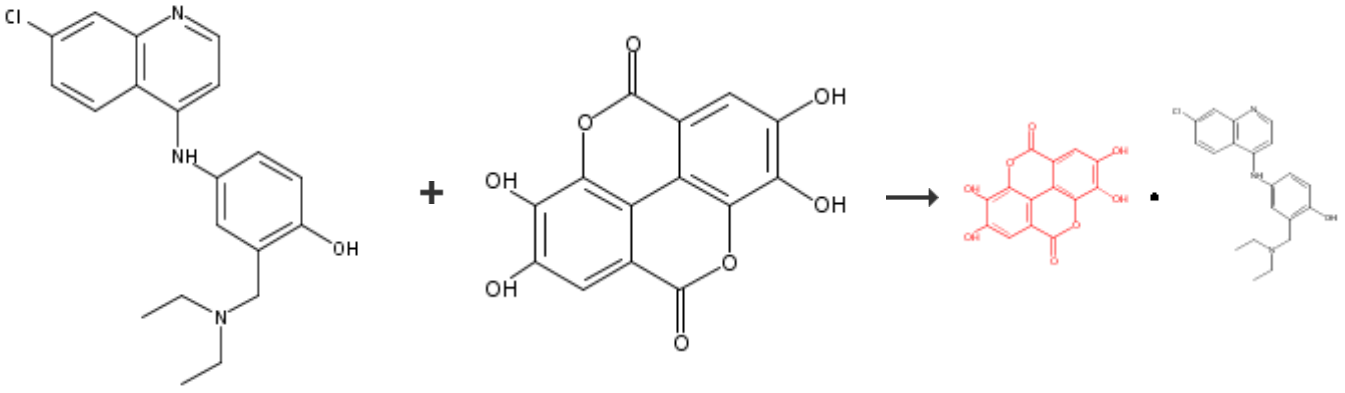
References

Inclusion complex of ellagic acid with β-cyclodextrin: Characterization and in vitro anti-inflammatory evaluation

By Bulani, Vipin D. et al

From Journal of Molecular Structure, 1105, 308-315; 2016

23. Single Step



Overview

Steps/Stages

Notes

1.1 S:EtOH, 8 h, reflux

Reactants: 2, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

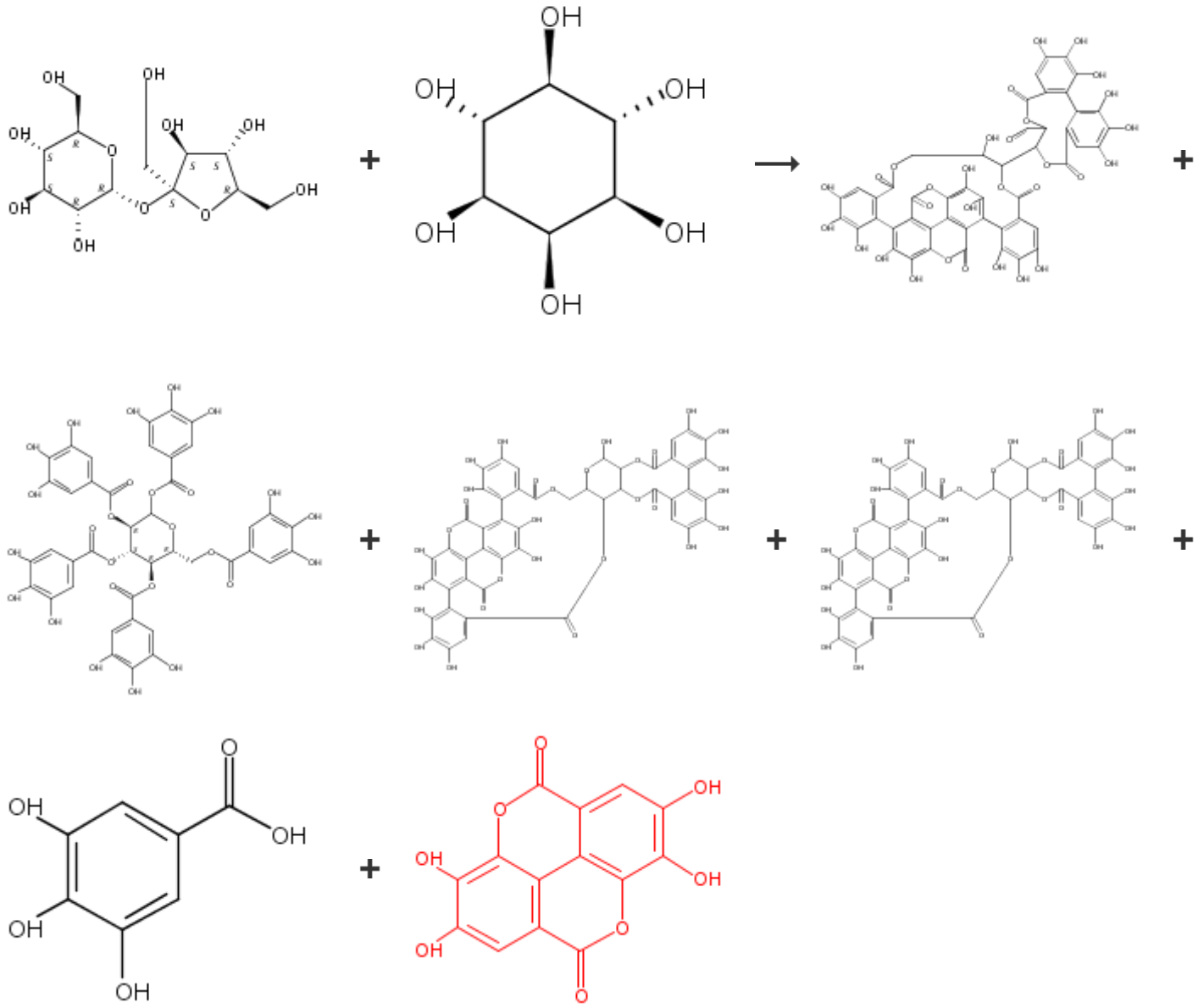
References

Influence of Amodiaquine on the Antimalarial Activity of Ellagic Acid: Crystallographic and Biological Studies

By Zeslawska, Ewa et al

From Chemical Biology & Drug Design, 84(6), 669-675; 2014

24. Single Step



Overview

Steps/Stages

Notes

1.1 C:86-87-3, C:525-79-1, C:94-75-7, C:1214-39-7, S:H_2O, > 4 wk, 25°C, 5.8 atm

biotransformation, enzymic, alternate reaction conditions using photochemical irradiation also shown, unspecified enzyme used, pomegranate cell culture used, casein hydrolysate used, buffered solution-unspecified buffer used, in the dark, Reactants: 2, Catalysts: 4, Solvents: 1, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Pomegranate derived cell culture and methods for preparing and using the same

By Hagay, Yoheved et al

From PCT Int. Appl., 2015102003, 09 Jul 2015