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| 12_Y.X. Zhang_Applied Material and Interfaces_2019_YNIL-NiO/g-CN_H2 generation      |  | Ternary hybrid catalyst composed of CN, NiO <sub>2</sub> and Ni complex were developed | by annealing 5 g of <b>urea</b> in a porcelain boat at 550°C for 4 hours under an argon atmosphere. After cooling to room temp. the resulting material was designated as CN |
| 13_Xin Zhao_ACS Catalysis_2020_Ni(imidazole)/gCN_cross coupling of ArX with ROH     |  |  | 10 g of <b>urea</b> in a covered crucible heaton at 500 0C at a rate of 2 0C/min for 2h.  |
| 14_R.Srivastava_Applied Nano Material_2021_Zr-Thia(x)/g-CN_CO2 insertion to epoxide |  |  | <b>Zr-thiamine + urea</b> - pyrolysed at 773K   |

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| 15_S_Roy_Angewandte Chemie International Edition_mpgCN[CoPPc_CO2 red.               |  | <b>mpg-CNx</b> was synthesized by <b>heating cyanamide in air using colloidal silica</b> as a hard template, followed by etching the template with aq ammonium bifluoride. This process creates a mesoporous structure ideal for photocatalytic applications   |
| 16_Maeda_JACS_2018_[Fe(qpy)(H2O)2]2+/mpg-CN_CO2-to-CO Conversion                    |  | To synthesize g-C <sub>3</sub> N <sub>4</sub> , <b>cyanamide was mixed with colloidal SiO<sub>2</sub></b> (1:1 w/w) and stirred at 333 K overnight. The mixture was heated to 823 K (2.3 K/min) and held for 4 hours. Silica was removed using NH <sub>4</sub> HF <sub>2</sub> , followed by filtration, washing, and drying at 343 K. - <b>mpg-CN</b><br><b>cyanamide</b> heated with a heating rate of 2.3 K min <sup>-1</sup> up to 823K, for 4 h. - <b>g-CN was obtained</b> (mpg-C <sub>3</sub> N <sub>4</sub> enhances electron-hole separation efficiency, improving photocatalytic performance. Compared to non-porous g-C <sub>3</sub> N <sub>4</sub> , mpg-C <sub>3</sub> N <sub>4</sub> shows a 20% higher photocatalytic ability for CO formation, highlighting the benefits of its mesoporous structure.) |
| 17_X_Zhang_Applied Catalysis B: Environmental_2017_g-C3N4/FeTCPP_Red of CO2         |  | <b>bulk g-CN</b> : - by typical <b>thermal polymerization of dicyandiamide</b> , simply heated 5 g dicyandiamide to 550 oC in muffle furnace with a ramp rate of 2.3 oC min <sup>-1</sup> and kept at this temperature for 4 h in ambient atmosphere.<br>- <b>g-C3N4 nanosheets</b> were prepared by direct thermal oxidation etching of bulk g-C3N4 at 500 oC for 2 h as reported previously  |
| 18_YZhu_Applied Catalysis B: Environmental_2014_CuTCPP/g-C3N4_degradation of phenol |  | 15 g of <b>dicyandiamide</b> was put in a Muffle Furnace and heated to 550°C for 4 h to complete the reaction. Finally, the yellow products were collected and ground into powder in an agate mortar   |

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| 20_X_Wang_ACSustainableChemistry&Engineering_2014_Co(bpy)3Cl2/g-CN_red. of CO2   |   | <b>Melamine is directly heated to 550°C</b> for 2 hours in an air atmosphere, resulting in the formation of <b>bulk g-C<sub>3</sub>N<sub>4</sub></b> . -10 g of <b>melamine</b> is dissolved in 10 mL of water, followed by <b>adding 5 g of silica (SiO<sub>2</sub>)</b> . The mixture is dried at 100°C to remove water, then sintered at 550°C for 2 hours in a muffle furnace. The resulting product is treated with a 4 M NH <sub>4</sub> HF <sub>3</sub> solution to remove the silica template, then washed thoroughly with distilled water and ethanol and then dried at 60°C in air overnight. |
| 21_B_Pieber_Angewandte Chemie International Edition_2019_NiCl2.glyme/ CN-OA-m_Esterification of Carboxylic Acids with Ar-X | A carbon nitride derivative CN-OA-m showed the highest activity in the photocatalyst screening, presumably due to its enhanced optical absorption in the visible region compared to most other known CN materials | (A carbon nitride derivative prepared via <b>co-condensation of urea and oxamide</b> followed by post-calcination in a molten salt ( <b>CN-OA-m</b> )[14] showed the highest activity in the photocatalyst screening) - a novel approach was employed to synthesize g-C <sub>3</sub> N <sub>4</sub> using a metal-organic framework (MOF), specifically HKUST-1, as both a template and a catalyst. This method involves the catalytic dimerization of cyanamide within the MOF's cavities at 90°C, leading to the formation of g-C <sub>3</sub> N <sub>4</sub> quantum dots (g-CNQDs).                 |
| 22_An-Wu_Xu_Catalysis Science & Technology_2018_g-C3N4/FcDA_H2 evolution   |   | <b>urea</b> calcined at 550 0C  |
| 23_Maeda_ChemSusChem_2016_RuRe/C3N4 (SiO2 modified)_CO evolution   |   | Mesoporous graphitic carbon nitride ( <b>mpg-C<sub>3</sub>N<sub>4</sub></b> ) is <b>synthesized by heating a cyanamide and silica mixture</b> , followed by silica removal with ammonium fluoride, yielding a porous, catalytically active material.  |

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|   |  | Mesoporous graphitic carbon nitride ( <b>mpg-C<sub>3</sub>N<sub>4</sub></b> ) is <b>synthesized by heating cyanamide with a silica template</b> , followed by template removal using ammonium hydrogen fluoride and subsequent drying, resulting in a porous material with high surface area for photocatalytic applications.   |
| 24_K_Domen_Phys.Chem. Chem. Phys._2010_MgPc/P/mpg-C <sub>3</sub> N <sub>4</sub> _H <sub>2</sub> evolution           |  | <b>Urea</b> is thermally polymerized by heating it to 550°C over four hours in an alumina crucible with a controlled ramping rate of 5°C per minute. After cooling to room temperature, the resulting material is washed and dried overnight at 60°C.<br>-Synthesis of <b>Thiophene-Embedded Polymeric Carbon Nitride (TPCN)</b> : A mix of 20 g of <b>urea</b> and <b>20 mg of ATCN</b> in 50 mL of deionized water is stirred at 80°C to remove the water. The resulting solid is placed in an alumina crucible wrapped in aluminum foil and calcined at 550°C for 4h with a heating rate of 5°C per minute. After cooling, the product is washed and dried overnight at 60°C.<br>--- The thiophene ring, a $\pi$ -electron-rich structure, is embedded into the carbon nitride framework, enhancing light absorption and charge separation efficiency. |
| 25_P_Zeng_Journal of Colloid and Interface Science _2021_NiL2(GI)2/TPCN_H2 evolution                                |  |   |
| 26_K_Mori_Phys. Chem. Chem. Phys._2015_TO-Ni(NiL2)2(GI)2/g-C <sub>3</sub> N <sub>4</sub> _H <sub>2</sub> production |  | <b>pyrolysis of dicyandiamide</b> . The process involves heating the dicyandiamide at 550°C in a covered crucible under air for 4 hours. This method produces g-C <sub>3</sub> N <sub>4</sub> , which serves as a support for further photocatalytic applications.  |
| 27_W.D. Zhang_Journal of Colloid and Interface Science_2019_NiLx-CN_H2 evolution                                    |  | heating <b>urea</b> at 550°C with a ramp rate of 10°C/min under an argon flow. The material is stabilized at this temperature for 4 hours and then allowed to cool to room temperature.   |
| 28_Suman L. Jain_Chemistry Select_2017_Co@mpg-C <sub>3</sub> N <sub>4</sub> _Esterification                         |  | the synthesis of <b>nanoporous graphitic carbon nitride (npg-C<sub>3</sub>N<sub>4</sub>)</b> involves heating a mixture of <b>dicyandiamide and thiourea</b> at controlled temperatures. The obtained material is then oxidized using hydrogen peroxide to introduce hydroxyl (-OH) groups on its surface. These groups are further converted to chloro groups using thionyl chloride, which are subsequently reacted with propargyl alcohol to produce propargylated npg-C <sub>3</sub> N <sub>4</sub> ( <b>PA@npg-C<sub>3</sub>N<sub>4</sub></b> ).   |
| 29_Suman L. Jain_Green Chemistry_Fe(bp)/3/npgC <sub>3</sub> N <sub>4</sub> _oxidative coupling of benzylamines      |  | same as above   |

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| 30_Suman L. Jain_ Journal of Colloid and Interface Science_2019_g-C3N4/CoPcCOOH_<br>photoreduction of carbon dioxide to methanol | g-C <sub>3</sub> N <sub>4</sub> is synthesized by mixing <b>dicyandiamide and thiourea in a 1:4 ratio</b> . This mixture is heated in a semi-closed aluminum crucible with a controlled ramp rate: 8°C/min to 300°C, 2°C/min from 300°C to 500°C, and 1°C/min to 550°C. The final calcination at 550°C is maintained for 4 hours.   |
| 31_Suman L. Jain_Carbon_2017_npg C3N4/Ir-T_Reduction of CO2 to CH3OH   | <b>npg-C<sub>3</sub>N<sub>4</sub></b> according to the provided paper involves <b>mixing dicyandiamide and thiourea in a 1:4 ratio</b> . This mixture is subjected to controlled heating in a muffle furnace with ramp rates of 8°C/min to 300°C, 2°C/min to 500°C, and 1°C/min to 550°C, followed by calcination at 550°C for 4 hours.   |
| 32_K. Maeda_JACS_2020_Coopy@mpg-C3N4_CO2 red to CO   | <b>(mpg-C<sub>3</sub>N<sub>4</sub>)</b> is synthesized by <b>polymerizing cyanamide in the presence of silica nanoparticles</b> as a template. The mixture is heated at 550°C to form a porous carbon nitride framework. The silica template is removed using an ammonium fluoride solution, resulting in mpg-C <sub>3</sub> N <sub>4</sub> with a high surface area.   |
| 33_N. R. Peela_Energy & Fuels_2021_VO(ecac)2/NS-GC_H2 evolution  | graphitic carbon nitride (GC) and sodium-sulphur dual doped graphitic CN (NS-GC)<br>GC- <b>heating melamine</b> in a semiclosed crucible at 550 °C for 4 h<br><b>NS- GC-</b> a calculated amount of <b>sodium sulfide and melamine were mixed</b> in 100 mL of water and stirred for 30 min to obtain a uniform mixture. This mixture was then dried overnight at 100 °C to remove the water content. The mixture was then calcined at 550 °C for 4 h in a semiclosed silica crucible |

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| 34_K_Maeda_The Chemical Society of Japan_2015_Ru(II) complex/CN_ HCOOH production |  | mesoporous CN   |
| 35_K_Ikeue_Materials Letters_Materials Letters_2017_NHME/g-CN_H2 evolution        |  | urea heated at 550 0C in crucible   |
| 36_M.Kombo_Catalysis science and technology_2013_C3N4/CoTPP_H2 evolution          |  | urea was added into covered alumina crucible and calcined at 550 °C for 4 h in a muffle furnace in air atmosphere |
| 37_K_Maeda_Angew. Chem. Int_2015_Ru (II) complex/C3N4_ HCOOH production           |  |   |
| 38_D. H. Wang_Journal of materials chemistry_2013_g-C3N4 / (FeTPP)2O_H2 evolution |  | urea in alumina crucible covered with Al foil heated at 660 0C  |

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| 39_D. Wang_ChemComm_2013_Ni-Tu-TETN/g-CN_H2 evolution by heterolytic cleavage            |  | thermal treatment of Urea                              |
| 40_E. Reisner_JACS_2016_oxidation of alc to produce aldehyde and red of aq. proton to H2 |  | heating melamine to 550 °C for 12 h under Ar following |
| 41_E. Reisner_Angew. Chem. Int. Ed._2014_H2 evolution by enzyme/CN or NIP/CN             |  |  |

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| 42_W. D. Zhang_ChemCatChem_CoL2(SCN)2-CN_ H2 evolution   |  | 50 g urea in a 100 mL ceramic crucible was calcined in a muffle furnace at 550 °C for 4 h at a heating rate of 10 °C/min after cooling, re-calcined at 550 °C for 2 h |
| 43_K. Maeda_J. Phys. Chem. C_2009_ H2 ans O2 evolution   |  | by heating cyanamide in air at 823 K for 4 h  |
| 44_X.Wang_Journal of Molecular Structure_2024_Cu(tpipa)/wt%g-C3N4 _degradation of dyes           |  | thermal condensation of urea  |
| 45_Ya-Ru_Pan_Inorganica Chimica Acta_2023_[Ni2(Medpq)2(BPDA)2H2O] · g-C3N4_ H2 evolution         |  | (g-C <sub>3</sub> N <sub>4</sub> ) is synthesized by heating urea in a crucible at 450°C for 2 hours with a controlled ramp rate of 5°C/min in a muffle furnace.      |
| 46_S. L. Jain_Journal of CO2 Utilization_2022_NIPc(g-C3N4_hydrocarboxylation of olefins with CO2 |  |   |



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| 47_Siddhartha Sankar Dhar_Chemosphere_2023_2-Mn/GCN_in deg of organic pollutant               |  | calcining 5 g of melamine in a crucible with a half-closed lid at 550 C for 4 h at 5 environment in a muffle furnace.   |
| 48_S. Vadivel_European Journal of Inorganic Chemistry_[Fe(acac)3]/g-C3N4_oxidation of alcohol |  | thermal decomposition of melamine at 550°C  |
| 49_P. A. Maggard_ACS Appl. Energy Mater._2023_CoO2 (qpy-Ph-COOH)/PTI-LiCl_Reduction of CO2    |  | melamine powder (1.000g) was ground in a mortar and pestle with a LiCl (0.933g) and KCl (1.327g) eutectic salt flux mixture (1:5 mol ratio of melamine to LiCl/KCl flux) until homogeneous. |
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