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| **Catalyst type** | **Catalyst name** | **Catalyst code** | **Synthesized compounds** | **Bioactivity** | **Reference** |
| Lewis base catalysts | Hayashi-Jørgensencatalyst | C1 |  | Antibacterial | (Rodriguez et al., 2020) |
| C2 |  | Antidepressant | (Szcześniak et al., 2019) |
| C3 |  | Anticancer | (Zhang et al., 2018) |
| C4 |  | Anticancer | (Li et al., 2019) |
| *N*-heterocyclic carbene (NHC) | C5 |  | Topoisomerase I inhibitor | (Zimmerman et al., 2020) |
| C6 |  | Antiparasitic | (Coelho et al., 2019) |
| C7 |  | Antirheumatic | (Murugesh et al., 2020) |
| *Tert*-leucinamide | C8 |  | Precursor of vitamin B5 | (Du et al., 2021) |
| Trimethylimidazolidin-4-one hydrochloride | C9 |  | Anticancer | (Pham et al., 2020) |
| Triphenylphosphine  | C10 |  | Antibacterial | (Gholami et al., 2019) |
|  | Antioxidant |
| Lewis acid catalysts | Trimethylsilyl trifluoromethanesulfonate | C11 |  | Anticancer | (Štadániová et al., 2020) |
|  | Hyamine | C12 |  | Antibacterial | (Arora et al., 2018) |
| Cinchonidine-derived quatern-ary ammonium | C13 |  | Antiandrogenic | (Guerrini et al., 2014) |
| Boron trifluoride diethyl etherate | C14 |  | Anti-inflammatory,Treat sleeping sickness,Postsynaptic-selective alpha-1-antagonist | (Mahecha-Mahecha et al., 2020) |
| Ethylaluminum dichloride | C15 |  | Antiangiogenic and antioxidizing | (Wu et al., 2022) |
| Bronsted basecatalysts | Pyrrolidine | C16 |  | Antirenal fibrosis | (Simek et al., 2022). |
| C17 |  | Anticancer | (Zhang et al., 2019) |
| C18 |   | Anticancer | (Xu et al., 2019) |
|  | Anti-inflammatory |
| C19 |  | Cathepsin K inhibitors | (Silva et al., 2020) |
|  | DBU | C20 |  | Antifungal | (Khan et al., 2018) |
|  | Antioxidant | (Gomes et al., 2020) |
|  | Anti-HCMV | (Herrmann et al., 2023) |
| Cinchona primary amine | C21C22 |  | Antibacterial | (Ernouf et al., 2018) |
| Quinidine | C23 |  | Anticancer | (He et al., 2022) |
|  | Cinchonine-derived squaramide | C24 |  | HRV protease inhibitors | (Wu et al., 2019) |
| DABCO | C25 |  | Ab 1-X inhibitor in PDAPP | (Winneroski et al., 2019) |
|  | HIV-1 NNRTI inhibitor | (Chen and He 2020) |
| 4-pyrrolidinopyridine | C26 |  | Dithiolated *O*-antigen of *E. coli* serogroup 64 | (Wan et al., 2023) |
|  | TBD | C27 |  | Photosensitizers in cancer therapy | (de Oliveira et al., 2019) |
| Bronsted acidcatalysts | Takemoto's thiourea | C28 |  | Treat Chagas disease | (Guerrero‐Corella et al., 2021) |
| Quinine-derived thiourea | C29 |  | Anticancer | (Wang et al., 2023) |
| C30 |  | (Li et al., 2023) |
| Chiral phosphoric acid | C31 |  | Antiviral and Anticancer | (Yan et al., 2022) |
| C32 |  | Anticancer | (Wang et al., 2022) |
| *α*-angelica lactone | C33 |  | Anti-platelet | (Thatikonda et al., 2020) |
| DES | C34 |  | Anti-inflammatory and Analgesic  | (Imran et al., 2020) |
|  | *p*-toluenesulfonic acid | C35 |  | Potential enzyme inhibitors | (Repetto et al., 2019) |
| Triflouoroacetic acid | C36 |  | Anticancer | (Srinivasulu et al., 2018) |
| Pyridine-2-carboxylic acid | C37 |  | AChE inhibitor | (Pervaiz et al., 2020) |
| Bifunctional organo-catalysts | Cinchona alkaloid catalyst | C38 |  | Anticancer | (Liu et al., 2021) |
| Cinchona-based thiourea | C39 |  | Antidepressant and Antiparasitic | (Park et al., 2019) |
| Cinchona alkaloids-derived squaramide | C40 |  | Anti-proliferative | (Chang et al., 2022) |
| Quinine | C41 |  | Anticancer | (Hammer et al., 2018) |
| Hydroquinine | C42 |  | Anticancer | (Kovalevsky et al., 2023) |
| Quinine-derived squaramide | C43 |  | Anticancer | (Zhao et al., 2023) |
| Proline | C44 |  | COX-2 enzyme inhibitor | (Akhtar and Lee 2020) |
| Prolinol | C45 |  | SPHK inhibitors | (Escudero-Casao et al., 2018) |
| C46 |  | Antidepressant | (Sharma and Pandey 2022) |
|  | *β*-amino alcohol | C47 |  | Dopamine agonists | (Chavan et al., 2019) |
| Chiral carbamate | C48 |  | RNA polymerase inhibitor | (Gannedi et al., 2021) |
| Organo-photo catalysts | 1,2,3,5-tetrakis(carbazol-9-yl)-4,6-dicyanobenzene | C49 |  | Anticancer | (Sherwood et al., 2018) |
| CC-CMP | C50 |  | Cholinesterase inhibitor,Antitumor andTreat glaucoma | (Ou et al., 2019) |
| Lumiflavin | C51 |  | Anti-convulsant, Thrombin inhibitor and Phosphodiesterase-4 inhibitor | (Chilamari et al., 2020) |
| Anthraquinone | C52 |  | Treat cardiovascular disease, Analgesic and Antimalarial  | (Zhao et al., 2023) |
| Eosin Y | C53 |  | Inhibitors of liver X receptor | (Vidyacharan et al., 2019) |