

Economic feasibility of vanillin production from Kraft lignin oxidation process integrating with alkaline regeneration process

부토안탕, 송대성^{1,†}, 임영일, 황경란², 김덕근²
한경대학교; ¹전남대학교; ²KIER
(daesungs@gmail.com[†])

Nowadays, the production of vanillin which has been widely used in valuable areas including food, cosmetic and pharmaceutical industry turns gradually from fossil to renewable sources such as lignin waste from pulp industry. This study reports a techno-economic assessment (TEA) for a vanillin production process from lignin by using ultrafiltration and alkaline regeneration technology. The process major units include: A100-Reactor, A200-Ultrafiltration, A300-Crystallization, A400-Boiler Recovery, and A500-Alkaline regeneration. The mass and energy balances were calculated by the Aspen Plus commercial simulator. Several economic criteria such as return on investment (ROI), payback period (PBP) and internal rate of return (IRR) were used to evaluate economic feasibility of the process. The process simulation and TEA shows promising economic feasibility with ROI of 15%, PBP of 6 years and IRR of 18.6%. Sensitivity analysis studies were also performed to evaluate the influence of several economic parameters such as electricity, lignin, and vanillin prices on ROI and PBP.