

## C425976 : MAJOR INDUSTRIAL MICROBIOLOGY  
KEY WORD: CELLULASE / RICE HUSK / SILICA / Trichoderma reesei.

BUNDIT FUNGSIN : UTILIZATION OF CELLULASE TO FACILITATE ISOLATION SILICA FROM RICE HUSK.

THESIS ADVISOR : ASSIST. PROF. SUTHEP THANIVAVARN, Ph.D.,

THESIS CO-ADVISOR : DR. REINHARD CONRADT.

122 pp., ISBN 974-632-869-7

Perliminary results revealed that the incorporation of cellulase into silica preparation system could hydrolyzed cellulose presence in rice husk and improved purity of silica after ashing. However, such reaction was found inhibit by metals or ions present in the husk itself. Addition of ethylene diamine tetraacetic acid (EDTA) at 0.2% (w/v) could chelate such substances and restored activity close to normal. Other factor that affected efficiency of cellulase was the absorption of enzyme by rice husk. It was found that upon the addition of Tween 80, an non ionic detergent at 0.1% (v/v) could increased efficiency of enzyme by 2.84 times. Optimal conditions for cellulase hydrolysis was : 9% (w/v) of rice husk pretreated with acid in deionized water, 0.02% (w/v) EDTA, 0.1% (v/v) Tween 80 pH 4.5-4.8 with agitation rate of 200 rpm at room temperature. Pretreatments of choice for use along with cellulase were : acid, autoclaving and boiling respectively. The best non-acidic pretreatment was autoclaving for 2 hours which gave a 83% of that of acid pretreatment.

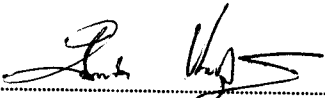
Cultivation of Trichoderma reesei IISTR 3081 for cellulase production were carried out by inoculating 5 fungal pellets into 100 ml of production medium supplemented with 2% avicel as cellulase inducer, the system was cultivated by shaking at 200 rpm for 7 days at room temperature. Under such conditions, yield of total cellulase, FPase, endoglucanase, exoglucanase and  $\beta$ -glucosidase were at 7.4, 0.9, 0.4, 0.15 and 0.29 unit/ml. of culture broth respectively. Supernatant from the isolated culture were showed to be able to hydrolyzed rice husk almost as good as commercial enzyme at room temperature, pH 4.6-4.8.

In all pretreated cases, the incorporation of cellulase could enhance the whiteness of silica after ashing in comparison to those without enzyme. The best combination observed was the use of cellulase on husk treated with HCl 1:5, by which a 99% purity was obtained and of higher than those observed in case of 1:4 hydrochloric acid pretreatment.

ภาควิชา จุลชีววิทยา.....

สาขาวิชา จุลชีววิทยาทางอุตสาหกรรม.....

ปีการศึกษา 2538.....

ลายมือชื่อนิสิต 

ลายมือชื่ออาจารย์ที่ปรึกษา 

ลายมือชื่ออาจารย์ที่ปรึกษารวม 