STUDENT PROJECT PROGRAMME
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A PROJECT PROPOSAL ON

FORMULATION OF ECO FRIENDLY DETERGENT POWDER FROM RICE HUSK ASH

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1. TITLE OF THE PROJECT - FORMULATION OF ECO FRIENDLY DETERGENT POWDER FROM RICE HUSK ASH

2. NAME OF THE COLLEGE AND DEPARTMENT - BAPUJI INSTITUTE OF ENGINEERING AND TECHNOLOGY, DAVANGERE-577004 AND CHEMICAL ENGINEERING.

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4. KEYWORDS- SODIUM SILICATE, RICE HUSK ASH, ACTIVATED CARBON.

5. INTRODUCTION /BACKGROUND -- RICE HUSK IS AN AGRICULTURAL RESIDUE ABUNDANTLY AVAILABLE IN RICE PRODUCING COUNTRIES. THE ANNUAL RICE HUSK PRODUCED IN INDIA AMOUNTS IN GENERAL APPROXIMATELY 12 MILLION TONS. RICE HUSK IS GENERALLY NOT RECOMMENDED AS CATTLE FEED SINCE ITS CELLULOSE AND OTHER SUGAR CONTENTS ARE LOW. FURFURAL AND RICE BRAN OIL ARE EXTRACTED FROM RICE HUSK. INDUSTRIES USE RICE HUSK AS FUEL IN BOILERS AND FOR POWER GENERATION. AMONG THE DIFFERENT TYPES OF BIOMASS USED FOR GASIFICATION, RICE HUSK HAS HIGH ASH CONTENT VARYING FROM 18-20%. SILICA IS A MAJOR CONSTITUENT OF RHA. SILICA CONTENT IN THE ASH IT BECOMES ECONOMICAL TO EXTRACT SILICA FROM THE ASH, WHICH HAS WIDE MARKET AND ALSO TAKE CARE OF ASH DISPOSAL.

PURPOSE OF STUDY

THE MAIN PURPOSE FOR THE STUDY OF UTILIZATION OF RICE HUSK
ASH AS A SILICA RICH SOURCE HELPS IN THE WASTE REDUCTION AND VALUE ADDITION FOR FARMERS. ANSWER FOR THE ISSUES RELATED WITH USE OF THIS STRONG WASTE SHOULD BE WORKED OUT FROM THE QUALITY PROSPECTIVE AS WELL AS QUANTITATIVELY TOO, IN LIGHT OF THE FACT THAT AMOUNT OF RICE HUSK CREATED IS VAST. BE THAT AS IT MAY, THE MOST ENCOURAGING AND GAINFUL UTILIZATION OF THIS BIOMASS IS ITS UTILIZATION FOR THE ELECTRICAL VITALITY AGE IN PROFICIENT WAY, OTHER THAN THIS UTILIZING RICE HUSK IN BIO-CONTROL AGE EMBRACING EFFECTIVE GIVES HARDWARE GIVES EXTREMELY PROFITABLE SIDE-EFFECT.

6. OBJECTIVES - THE PROJECT MAINLY AIMS IN MAKING A DETERGENT POWDER FROM RICE HUSK ASH. MESOPOROUS SILICA IS USED AS A RAW MATERIAL IN SEVERAL AREAS: AS A COMPONENT OF DETERGENTS AND SOAPS, AS A REFRACTORY COMPONENT ETC. SODIUM SILICATE IS PRODUCED BY REACTING RICE HUSK ASH (RHA) WITH AQUEOUS NAOH. SILICA IS PRECIPITATED FROM THE SODIUM SILICATE BY ACIDIFICATION. IN THESE CONVERSIONS ABOUT 90% OF SILICA CONTAINED IN RHA IS OBTAINED IN THE FORM OF SODIUM SILICATE IN AN OPEN SYSTEM AT TEMPERATURES OF ABOUT 100°C. THE FILTRATE CONSISTS OF SODIUM PHOSPHATE. THIS WAS USED AS A ONE OF THE INGREDIENTS IN FORMULATION OF THE DETERGENT POWDER.

7. METHODOLOGY

1. COLLECTION OF THE RAW MATERIAL.
2. SILICA EXTRACTION FROM RICE HUSK ASH.
3. ACID PRETREATMENT OF MATERIALS.
4. FORMULATION OF DETERGENT POWDER.

8. RESULTS AND CONCLUSIONS

GENERAL MATERIAL BALANCE

MATERIAL BALANCE
<table>
<thead>
<tr>
<th>Rice husk ash</th>
<th>10 (g)</th>
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<tbody>
<tr>
<td>Total silica in the ash</td>
<td>9.2(g)</td>
</tr>
<tr>
<td>Extractable silica</td>
<td>6.3(g)</td>
</tr>
<tr>
<td>Quality</td>
<td>Good for bricks</td>
</tr>
<tr>
<td>Byproduct</td>
<td>Sodium silicate</td>
</tr>
</tbody>
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It is found that it is possible to recover over 60% of the silica contained in RHA by simple digestion with aqueous sodium hydroxide and precipitation of silica by acidification of the sodium silicate solution so obtained. The silica obtained is largely amorphous.

9. SCOPE OF FUTURE WORK-

1. **Future work will also be needed to establish the refining of the RH-Si powder using known or novel techniques that advantage of the relatively low group impurities and the more reactive impurities contained in the RH-Si.**

2. **Advance future work on characterizing the electrical properties of the RH-Si ingot will eventually add value to the RH-Si product and make it more attractive not only to the PV industry but also other industries that require high purity silicon at reasonable cost.**

3. **Future work is to conduct the same procedure for different grades of detergent.**