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CHEAPER AND SAFE ALTERNATIVE SOURCE OF ENERGY

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ABSTRACT

Fossil fuels like coal, petroleum are to deplete fastly. Alternative source is nuclear energy. But uranium is costly. The radioactive decay disposal is great problem. Our previous experience about the failure in Russia and Japan is there solar energy can be produced by the algae, Anabeana cylindrical culture. Other algae can be used some modification. The simplest and easily available source of electrical energy is to use animal waste like cow, pig litters or human waste. Examples such uses are there in U.S.A, Uganda. The present paper describes a critical approach which is beneficial in the light of present crisis.

INTRODUCTION

Nuclear energy is not safe to use, although it produces giant amounts of energy. Below mentioned reaction describes it :

(1) When one mole (6.02×10^{23}) or 16g. CH_4 is burnt, over 200 kcal of heat are liberated as :

$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O + 211$ (kcal/mole CH_4).

(2)When $^{7}_{3}Li + ^{1}_{1}H \rightarrow 2\ ^{4}_{2}He + 23000$ Kcal/mole of $^{7}_{3}Li$

The use of nuclear energy to generate electricity is much more advanced in Europe than in U.S.A.Nuclear reactors supply 65% of electricity to France is 16% in the United States.

It is possible to convert the nonfissionable $^{92}_{238}U$ and $^{92}_{232}Th$ in to fissionable fuels by using a breeder reactor. The two breeder reaction sequences are:

(a) $^{92}_{238}U \xrightarrow{1n_0} {}^{239}_{92}U \xrightarrow{\beta} {}^{239}_{92}Np \xrightarrow{\beta} {}^{239}_{94}Pu$

(b) $^{232}_{92}Th + {}^{1}n \rightarrow {}^{233}_{0}Th \xrightarrow{\beta} {}^{233}_{90}Pa \xrightarrow{\beta} {}^{233}_{91}U$

The products of breeder reactions $^{239}_{92}U$ and $^{239}_{94}Pu$ are both fissionable with slow neutrons and neither is found in the earth crust.

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(1)These breeder reactors present many technological problems.

$^{239}_{94}Pu$ is toxic.

In chemical and radiation point of views

On April 26, 1986 an explosion at the Chernoble nuclear power plant near Kiev in Soviet Union. Sweden recorded sudden jump in radioactive isotopes of Kr, Xe, I, Cs and Ba. Ground water, soil and food supplies near Kiev.

More than 51 million pounds of radioactive wastes are buried in ground near Oak Ridge. So it can be said that one person's solution is another person's pollution. The danger in transporting nuclear wastes is the spread of dangerous radioactivity, not a nuclear explosion. Recently, Japans nuclear plant exploded. Recently a simple experiment has been conducted by the dept. of chemistry students under kind supervision of HOD chemistry. Details are as described below:

A colony of some algae like Anabeana cylindrica can convert sunlight and water into the H_2 and O_2, could be a source of energy. Pictorial representation is described in the Fig No. 1.

THREE PHASE (a,b,c) to TWO PHASE (d,q,0) TRANSFORMATION

This is a simple diagram whose aim is only to mention that solar energy can solve many problems. At present the energy crisis can be solved to some extent. The

requirement of energy per year is between 10^{25} to 10^{30} Kcals.

The fossil fuels are on the verge of depletion. Gas produced from cow waste had been strongly promoted in Indias rural areas with big subsidies. But it was not a great success mainly because Indian workers were not willing to maintain it, with accelerating world shortage of power and rising fuel costs many have started using bio wastes. San Fransisco is generating some power from pet poop while several US farms utilize pig litters.

San Aantinio generates electric power from human faeces. The world's seven billion people produce about 140 million tons of faeces every day. 25% of this has the potential power to produce roughly 100,000 MW of energy. India with $1/7^{th}$ of world's population can generate over 12,000 MW. The technology is quite simple and cheap. Rawanda has installed 20 human waste power generation of 500 KW. These produce half of the electricity the country requires. Rawanda has earned Ashden Award for sustainable energy with a cash component of $ 50,000.

Process

The waste is collected and fed into a Silo where from it is pumped into a large closed tank, stirred with electric paddles with a little water and air.CH_4 gas produced is directed used as fuel.UK has a power plant generating 12.7 MW of energy and consumes 125,000 tonnes of powerty litter/year. Now it has started human waste plant at Northan Ptonshire [1].

The world is heading fastly towards an energy crisis. Socio-economic development, standard of living, as well as the quantity of life. These depend upon the availability and supply of energy. Energy is an important input for economic developments [2].

Biomass alone currently meets 57% of the national demand now. Yet we use low grade fuel which provides 63.3% of India's energy production .Hydroelectricity, natural gas and nuclear energy accounts for 8.9%, 8.2% and 1% electricity [3]. Biogas is odorless. When other gases are associated with it, the smell of garlic or rotten eggs is felt. When CH_4 gas is completely burnt it produces blue flame.

A Dutch recycling mill produces fuel pillets, when organic molecules are separated from the fibre and compressed into the pillets, temperature of more than 800°C [4].

Anaerobic digestion of Cellulose materials

Agriculture represents a substaintial readily available biomass could be converted into clean fuel (CH_4) using anaerobic fermentation. Cellulose is a linear polymer of pure anhydroglucose units joined by 1,4 glucosidic bonds. Anaerobic fermentation produces CH_4 and CO_2. Bacteria decompose the complex carbohydrates, lipids and proteins in Cellulosic biomass into more simple compounds. The gas mixture comprises of 70-75% CH_4, 10-15% CO_2 and 5-10% moisture. The blue flame is produced due to CH_4 [5,6]. After biogas production, the residual mass can be used as fertilizer in the crop field.

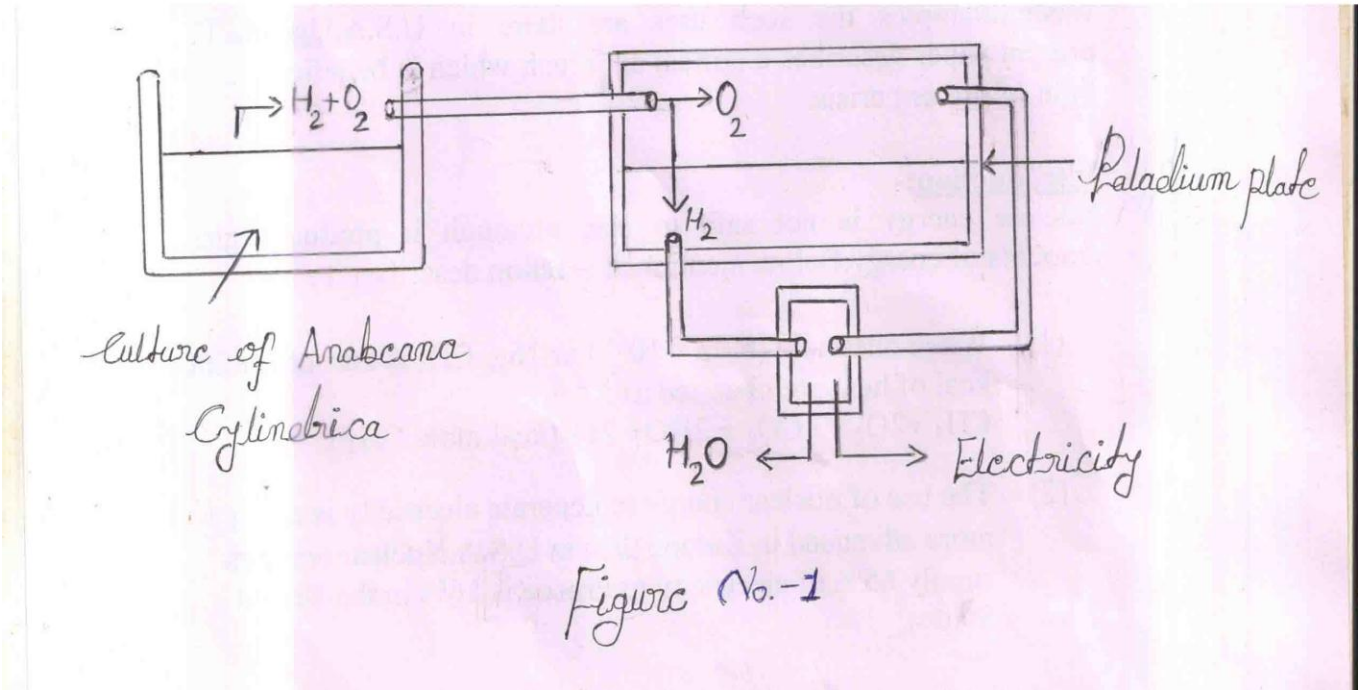

Figure No.-1

REFERENCES

1. Murad Ali Baig. (1995). A Delhibase writer.Times of India New Delhi.
2. Unni BG. (2006). Clean fuel from waste.A biotechnological approach. *Res.J.Chem and Environment*, 10 (2).
3. Anonymous. United States Energy Information Administration. Country profile : India.www eia doc.gov.
4. Waste management, (2001). Waste Magazine (Germany).
5. GATE. (1999). Biogas technology in Orissa,India.
6. Tata. (1998). Tata energy Data and Directory year book 1967/8 . Tata Energy Research Institute New Delhi.