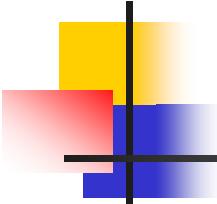


# Technological progress in China's bio-diesel industry

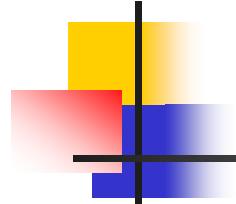
Dr. JiXing  
2005 11 8



# Importance of Developing Renewable liquid fuel

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- Large import of Crude Oil  
( $2004 - 1.227 = 2003 * 35\%$ , No.2)
- Environment protection
- PM from diesel
- Strict Environment protection need clean fuel
- China's Crude oil becomes heavier and more content of N and S
- Lack of oil -----energy supply security and rational economy development

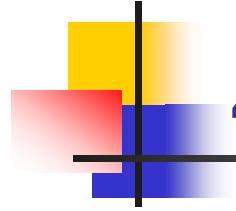


## Detailed introduction of Biodiesel

**total production : $\geq$ 50 k tons;**

**Listed in RE law and state key scientific & technological development plan**

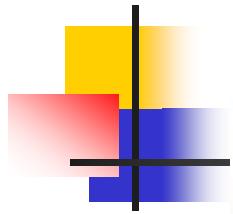
- **Technology:**
- **Conventional technology: acid and alkali catalyzed reaction in large production**
- **Lipase + supercritical flow reaction -----in lab and batch test**
- **Raw material : wild tree nut  
Waste grease**



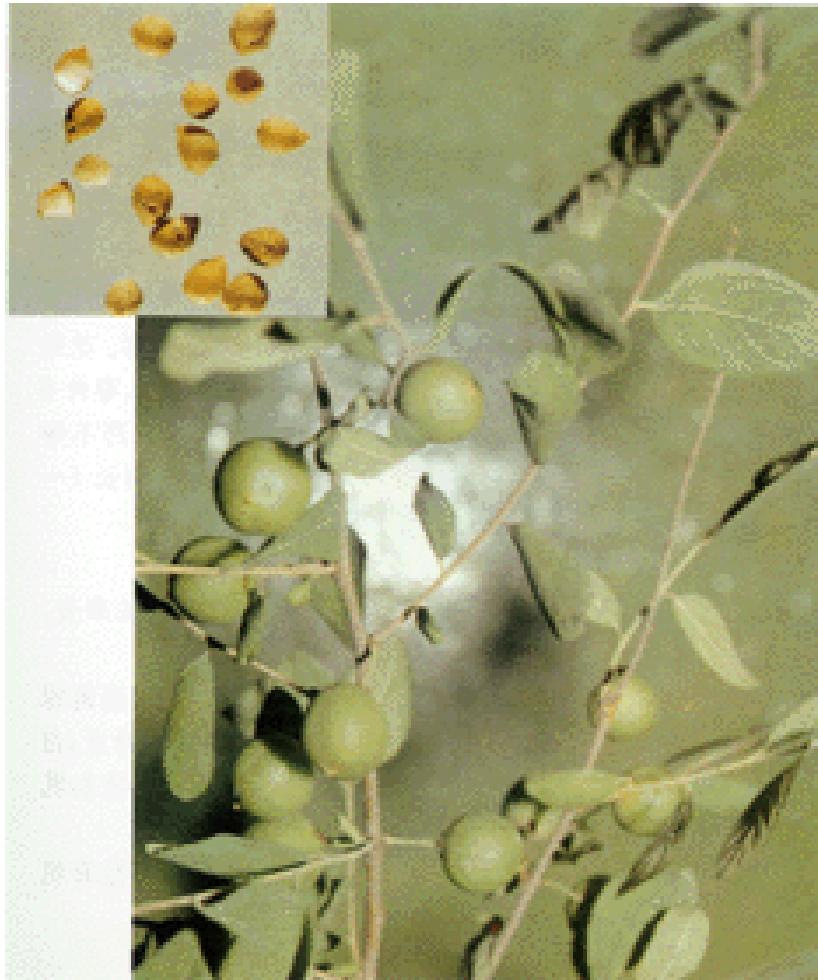
# Zhenghe Co.Ltd

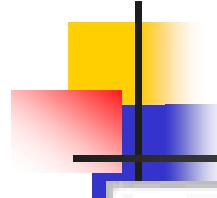


# Gu shan Co Ltd



# wild tree nut--欧李



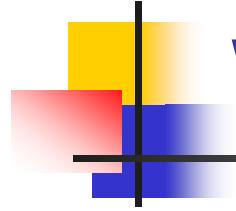


## wild tree nut--黃连木



# wild nut –文冠果





# Wild nut----麻风树



# Acid Oil foot----residue of refining process in oil and grease plant



# Waste grease-----kitchen leftover

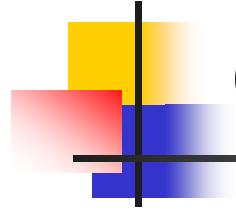


2004 7 25

# Sewage garbage---from grease trap in restaurant

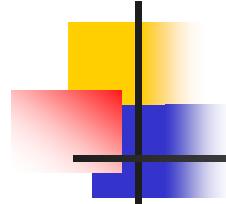


2004 7 25



# Gel like Sewage garbage



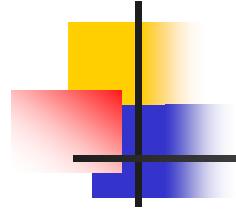


# Refining process

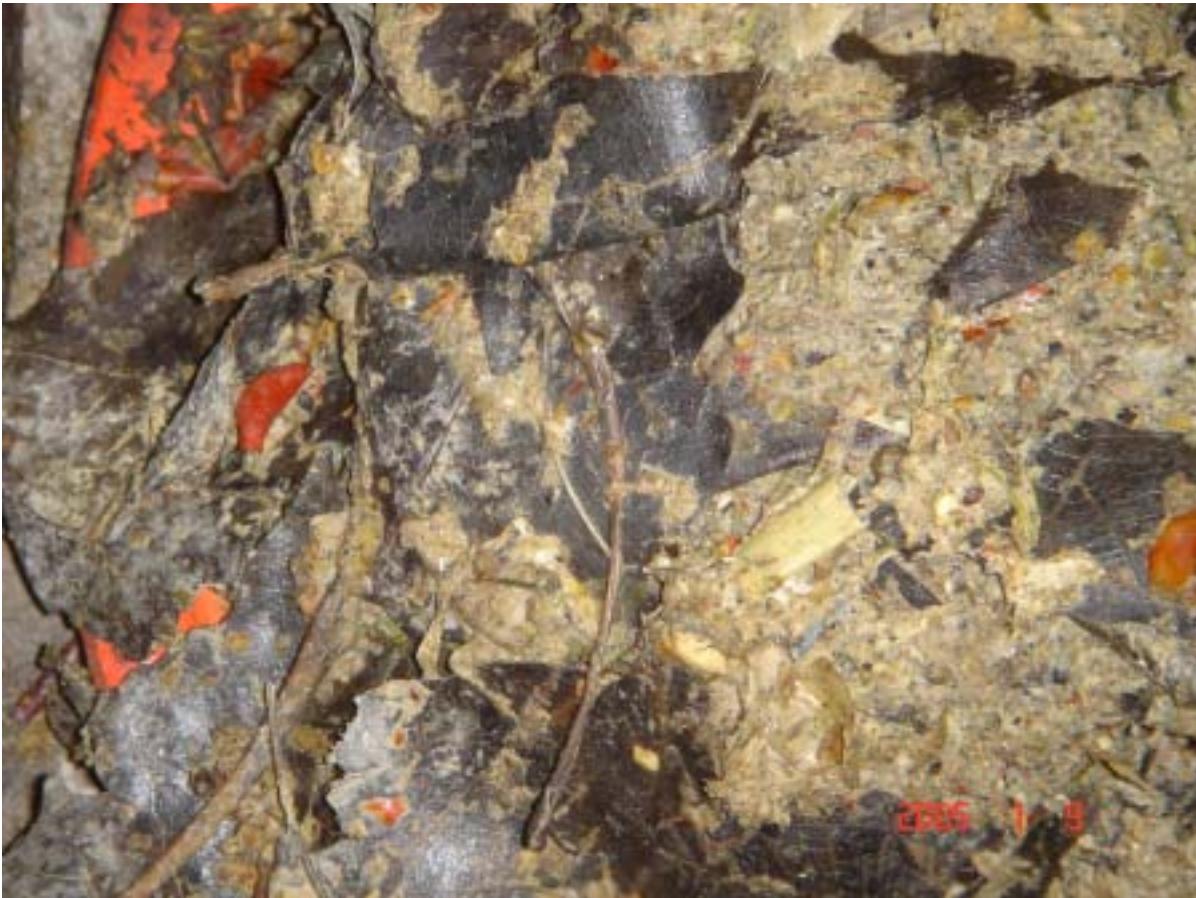


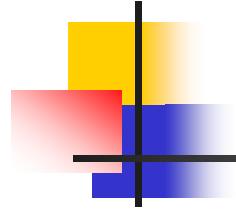
# extraction process –waste grease sample





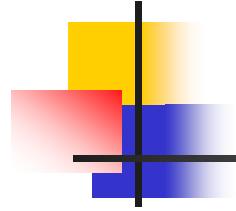
# Residue from grease trap





## extraction process ---residue





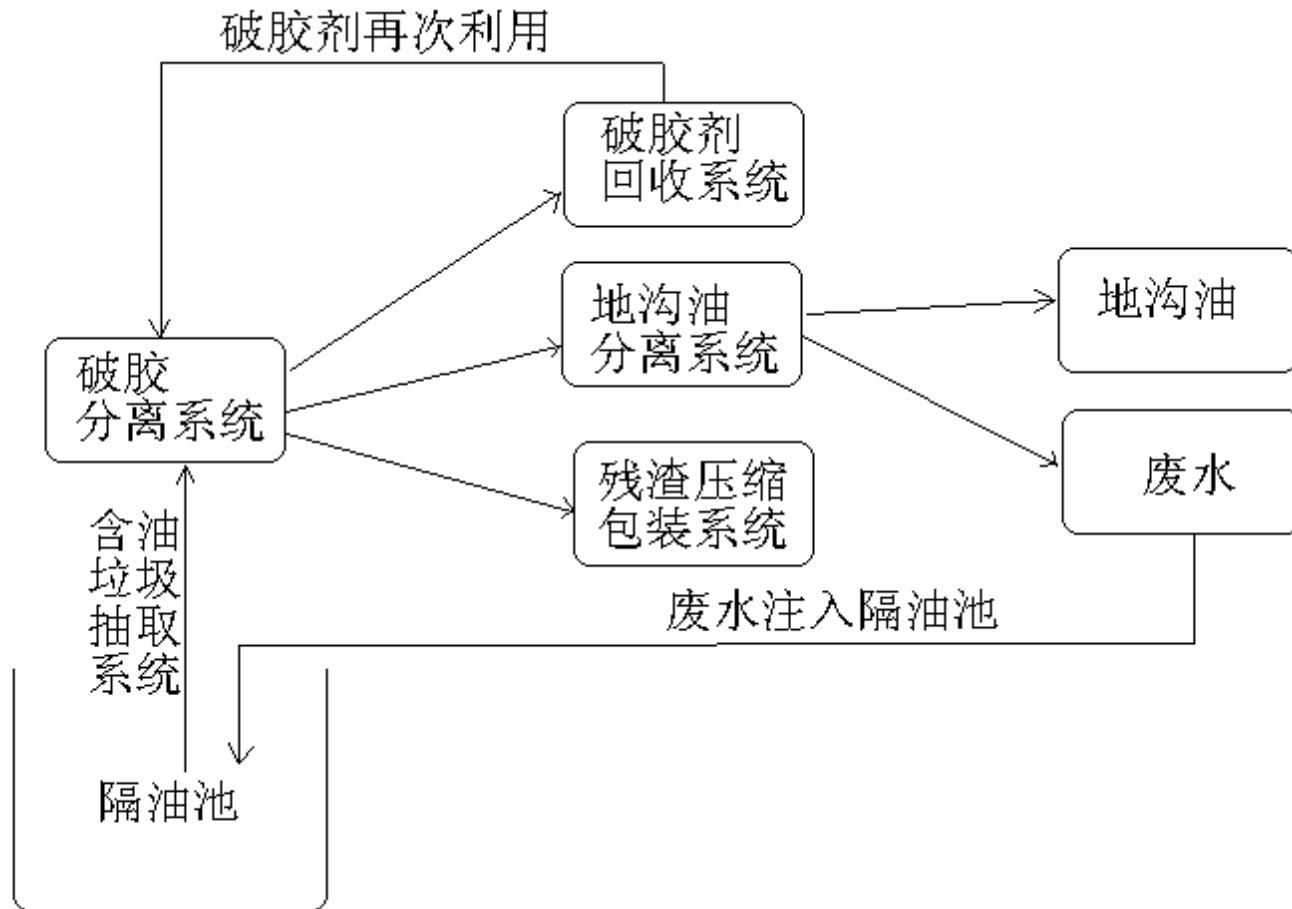
## pyrolysis oil ---- fuel for water boiler

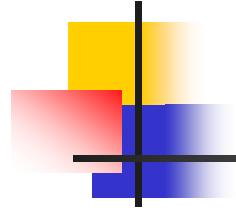


# Pyrolysis residue –waste water filtration



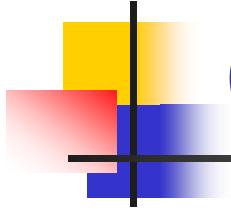
# Extractor :schematic diagram





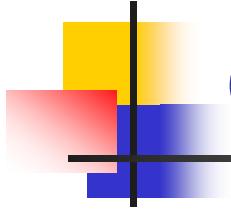
# waste grease extractor





# Conversion to bio-diesel



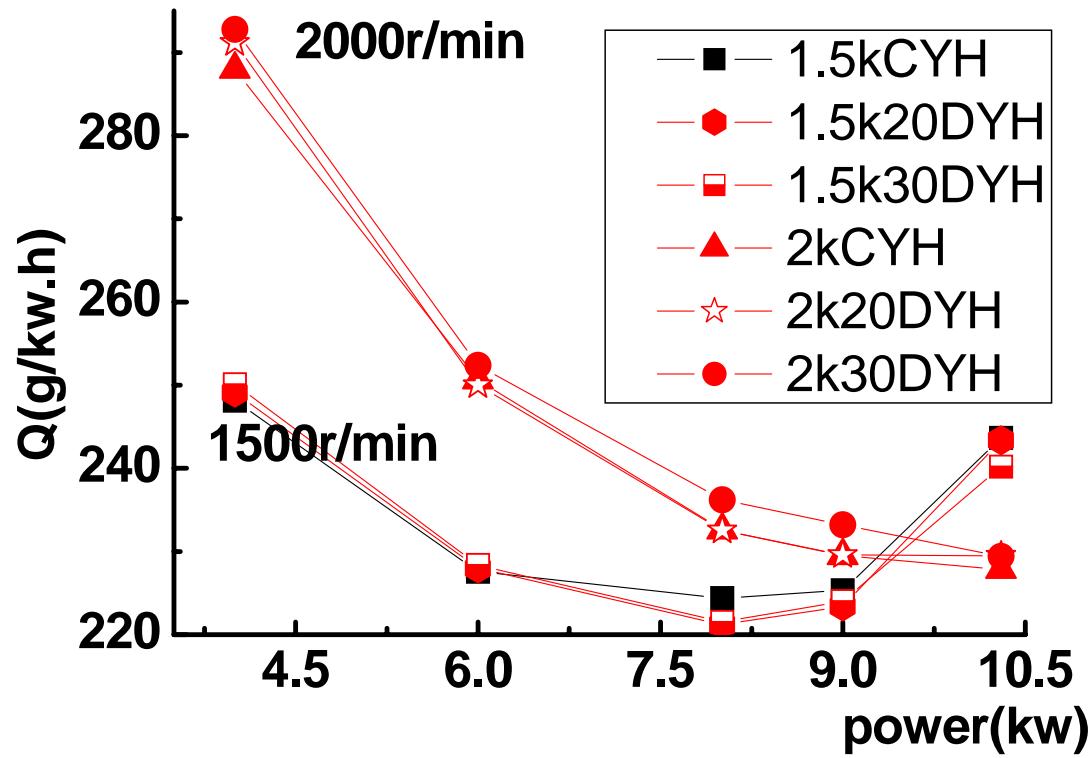


# glycerol

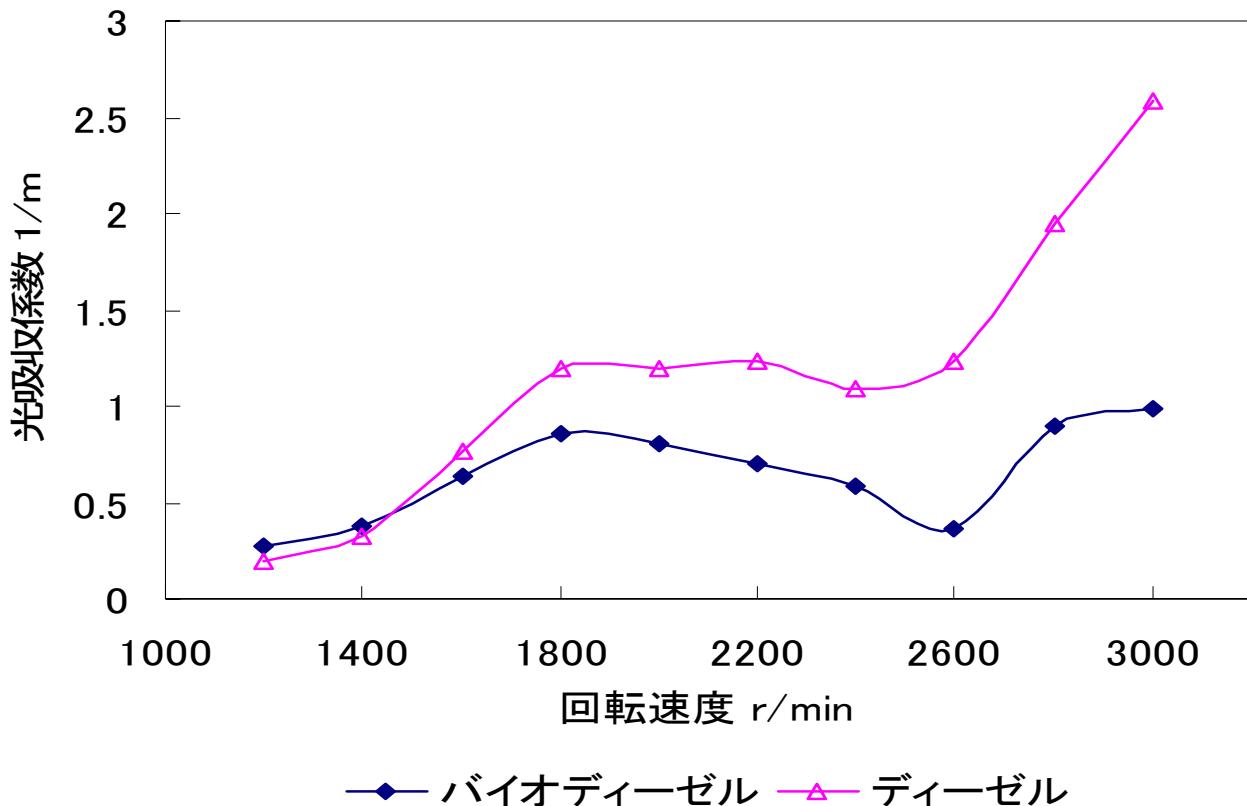


2004 11 5

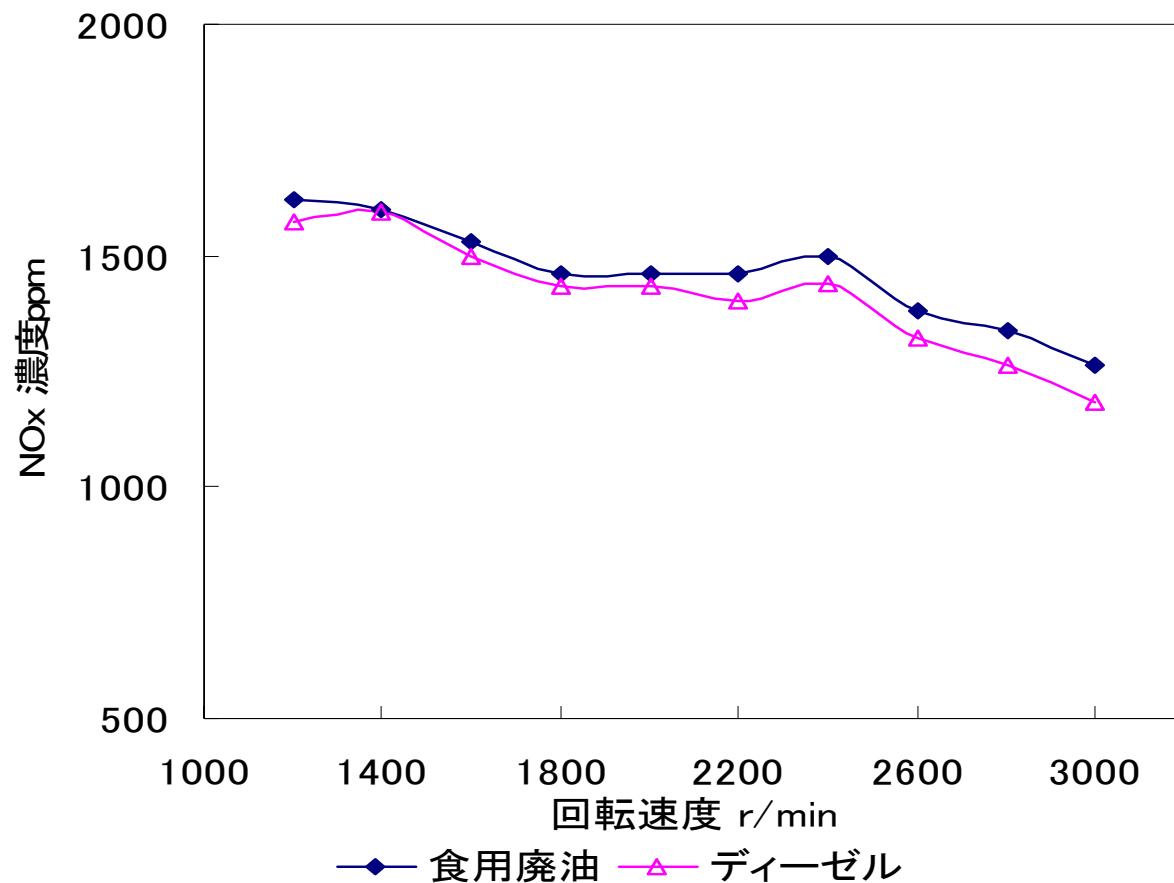
# Oil consumption



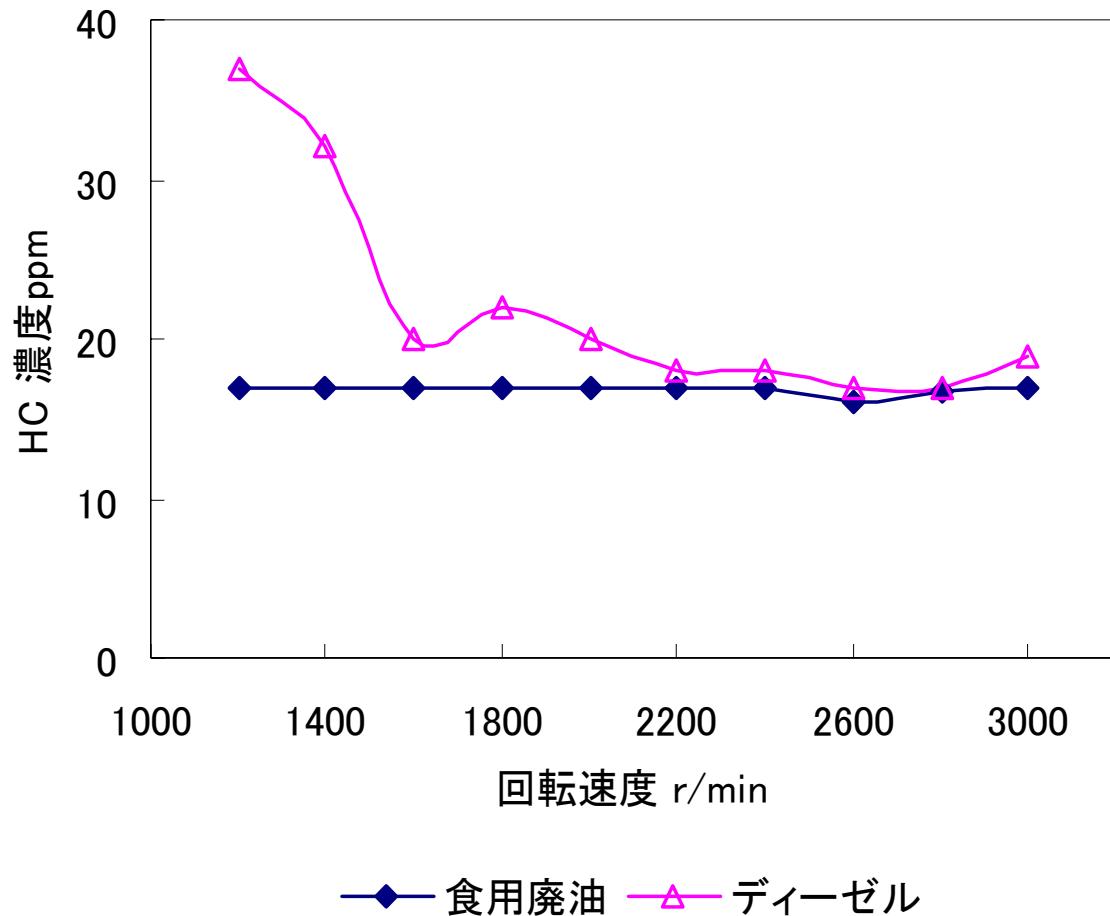
# emission

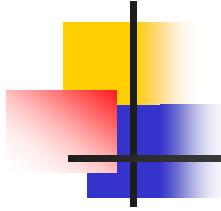


# NOX emission



# HC emission

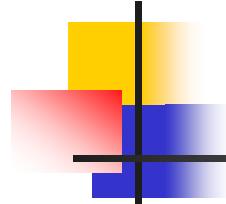




## Engine test result

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Same as the bio-diesel obtained  
from rape seed oil



## Economics & Prospect :

Waster oil ----600-800 RMB/ton;

Biodiesel :<2200RMB/ton;

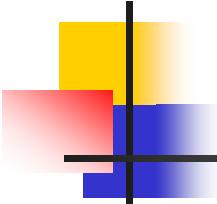
Short term:

Beijing+ shanghai +Tianjin+ Chongqing= 200,Kt/a

30\* provincial capital \*2=600,Kt/a

Long term :2M-4Mt/a

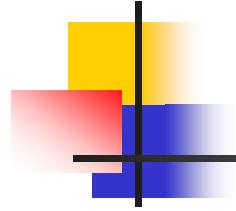
**Bio-diesel power the 2008 Beijing Olympics**



# Future orienting production line

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- Grease trap waste ---- biodiesel+ glycerol
- Wild tree seed---- biodiesel+ glycerol



# Cooperation

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- Bio-diesel
- Grease trap waste ----biodiesel+ glycerol
- Wild tree seed---- biodiesel+ glycerol
- Demonstration project
- Policy research: share experience
- pyrolysis liquid fuel from biomass
  - technological research : quick heating slow heating and super-critical pyrolysis batch test and vehicle test
- synthesized oil from biomass
- common weakpoints ? How to do then?