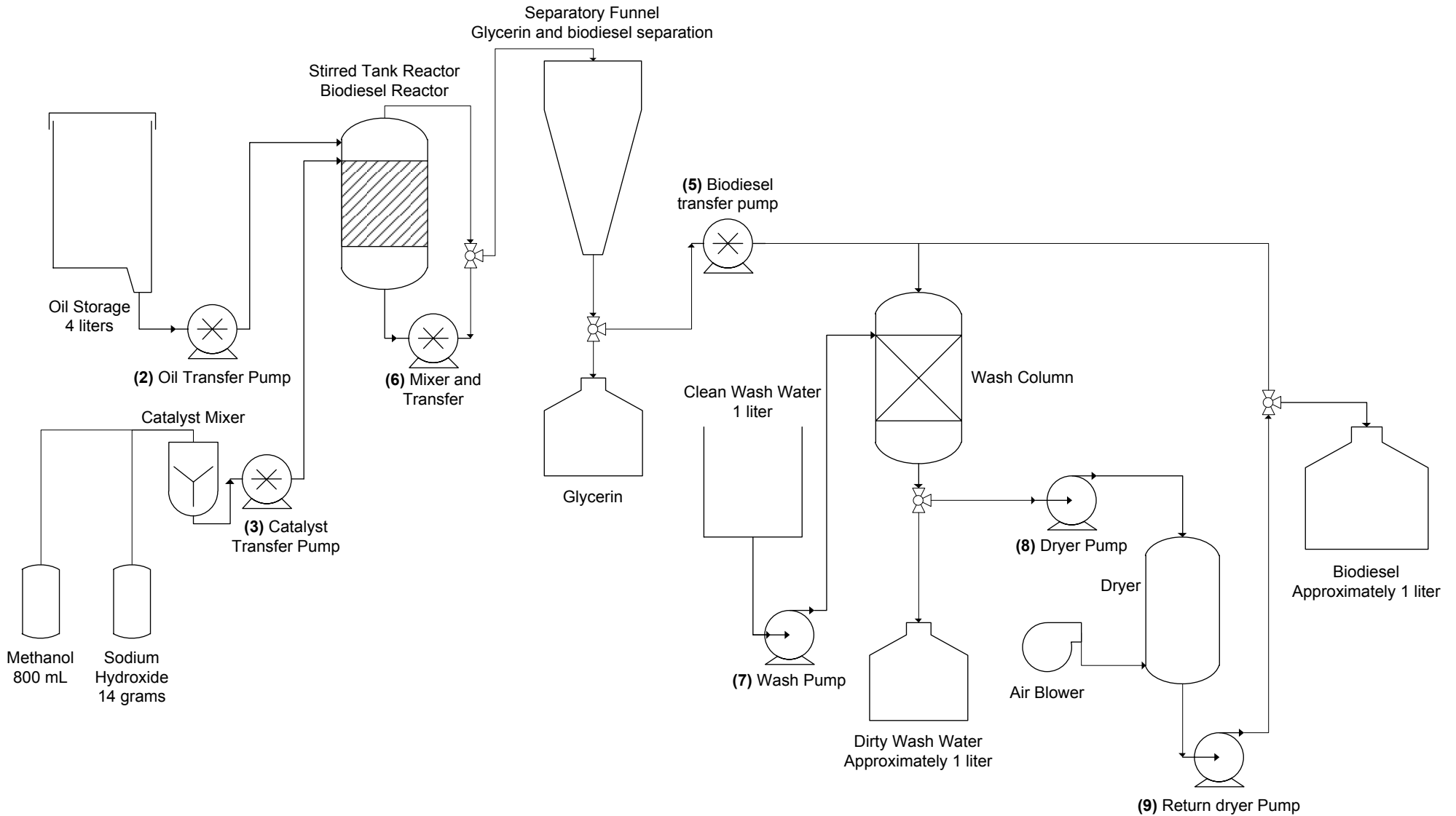


# OSU Biodiesel Demonstration Cart



# Setup

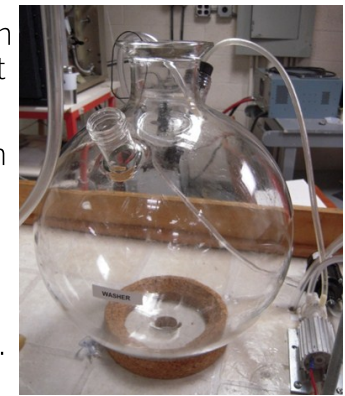
- 14g lye (NaOH) into 24mL vial, label & seal tightly
- 800mL methanol (MeOH) into 1L storage container, seal & label
- 4L vegetable oil, label
- Connect all hoses, switch off all electronics
- Connect cart to battery

# Procedure

- Fill plastic tank labeled “oil” w/ 4L oil
- Add methanol, lye, and stir bar to 1000mL beaker, turn on mixer under cart, run until lye is almost completely dissolved
- Move oil to reactor w/ pump 2. Turn off when done. Do not run dry.
- Move methanol-lye soln to reactor w/ pump 3. Turn off when done.
- Turn on reactor mixer using switch under cart (image at right)
- Turn 3-way connector on pump 6 to direct fluid to opening on top of reactor, then turn on pump 6. This is to enhance mixing. Turn off pump 6 periodically so that it does not overheat.
- Let reaction take place for 30 min–2 hours depending on conditions. Biodiesel is ready when color turns translucent honey-gold.
- Turn off pump 6 and mixer, switch 3-way connector on pump 6 to direct fluid to separatory funnel, turn back on pump 6 & drain reactor.
- Allow to settle for 1-3 hours (longer is better). Denser glycerin separates on bottom, biodiesel is clear/yellow on top. When finished, drain glycerin into sealable container.
- Drain off glycerin into a sealable waste container.



- Transfer biodiesel to washing vessel (right) with pump 5 and fill smaller separatory funnel to left of washer with water.
- Turn off pump 5 when biodiesel is drained, then turn on pump 7 to begin washing process. Use all of the water before proceeding.
- Place the waste bucket near the washer. Configure the three-way connector under the washer to send water into the waste container.
- Use pump 8 to drain water from the washer. Test for neutral pH, once it is a neutral pH turn off pumps 7, then drain water with pump 8.



- Turn off pump 8, switch 3-way connector to direct flow to dryer, turn on pumps 8 & 9, and drying fan. Stop pump 8 if biodiesel gets too high.
- Let biodiesel circulate in dryer (right) as long as possible (4-8 hours). When finished, turn off pump 8—biodiesel will drain to washer. Then turn off pump 9 and drying fan.
- Switch 3-way connector under washer to move biodiesel to 6L separatory funnel. Turn on pump 8 and drain washer to funnel.
- Let sit in funnel for several hours. When finished, remove lower layer w/ water and biodiesel mixture. Seal and label waste water.
- Drain biodiesel into a storage container, label and seal.



# Cleanup

- Drain excess biodiesel from hoses into waste container
- Reconnect hoses
- Run 3L water w/ 1 Tbsp oil eater through all pumps and containers
- Run clean water through whole system
- Disconnect hoses that need drying
- Unplug cart and clean up any spills
- Dispose of waste in appropriate location, then label all containers w/ name, contents, and contact info