

DRAFT

TO: JON CHASMAN
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ENVIRONMENTALLY RESPONSIVE FUNCTIONAL FLUORO-CHEMICALS

TONY MANZARA

or friendly

***** (MEANS PAGE BREAK)

BACKGROUND - MOST FUNCTIONAL SCD PRODUCTS ARE DERIVATIVES OF

PERFLUOROOCTANE SULFONAMIDE

C8F17SO2N<

PERFLUOROOCTANE SULFONIC ACID SALTS

C8F17SO3-

AMMONIUM PERFLUOROOCTANOATE

C7F15CO2-NH4+

FORMERLY EXPECTED TO BE BIOLOGICALLY "INERT"

evolving understanding of effects from exposure to these biologically "inert" materials

REPORTED:

CF3(CF2)7CH2CH2OH --> (RAT) CF3(CF2)6CO2-

FCH2CO2-Na+ --> (BACTERIA) HOCH2CO2-

PRESENT SITUATION:

biologically active compounds

UNDENIABLE BIOLOGICAL EFFECTS:

SULFONAMIDE C8F17SO2NHC2H5 USED IN FIRE-ANT POISON

SALT C8F17SO3-Li+ PROPOSED FOR INSECTICIDE

REQUIREMENT FOR BIODEGRADABILITY IN GERMANY FOR PRODUCTS
RELEASED INTO THE ENVIRONMENT - CLEANERS, FLOOR WAX,
ETC. "90% OF EACH SURFACTANT"

STRONG PUSH FOR ENV. DEG. INGREDIENTS FOR AFFE FORMULATIONS
U.S. AIR FORCE

environmentally degradable

GOALS

TECHNOLOGY PROGRAM:

IDENTIFY FLUORO-CHEMICAL BUILDING BLOCKS WHICH ARE
CONVERTED UNDER BIOLOGICAL INFLUENCE TO FLUORIDE ION,
CO2, AND WATER.

PRODUCT PROGRAM IF TECHNOLOGY DEVELOPMENT SUCCESSFUL:

USE IDENTIFIED BIO-RESPONSIVE FC BUILDING BLOCKS TO
MAKE SUITABLE INGREDIENTS FOR FLUORO-CHEMICALLY ACTIVE
PRODUCTS.

PROGRAM PLAN: (AEROBIC SCREENING PORTION)

CHOOSE MICROORGANISMS FROM SOURCES LIKELY TO HAVE FC-PHILES
CHEMOLITE WASTE TREATMENT
DECATUR WASTE TREATMENT
ETC. (SOIL COLLECTIONS...)

30 CANDIDATES CHOSEN BASED ON CHEMICAL STRUCTURAL FEATURES

MAKE MASTERBATCH AND EXPOSE (PRECONDITION) WITH MIXTURE OF
CANDIDATE FC COMPOUNDS

DIVIDE CULTURE INTO PORTIONS AND FEED EACH ONE A SEPARATE
CANDIDATE

ANALYZE BIOLOGICAL OXYGEN DEMAND AND PRODUCTS OF METABOLISM

*****8

PROGRAM PLAN: UNIVERSITY RESEARCH

A GRADUATE STUDENT IS BEING SPONSORED TO DO ANAEROBIC
DECOMPOSITIONS OF FC MATERIALS - CAPITALIZE ON THIS WORK

~~PROGRAM POSSIBILITY: BUILD BETTER BUGS?~~
~~SELL OR LEASE TO INDUSTRIAL USERS~~

PROGRAM PLAN CONTINUED:

CHEMICAL SYNTHESIS OF STRUCTURES DESIGNED AROUND
FEATURES FOUND TO ENHANCE BIO-SENSITIVITY

CONVERSION OF THESE INTERMEDIATES TO ACTIVE PRODUCTS.

PEOPLE INVOLVED SO FAR:

ENVIRONMENTAL GROUP

ROBERT HOWELL- LITERATURE AND ADVICE

FLUOROCHEMICAL TECHNOLOGY CENTER

JOHN C. HANSEN- SAMPLES

PAT SAVU- SAMPLES

GEORGE MOORE- SAMPLES

BRAINSTORMING SESSION

ABOUT 15 PEOPLE, S.C.D., F.C.T.C., I&C, ENVIR.

~~HOPED-FOR STAFFING:~~

~~EXPERIENCED SYNTHETIC CHEMIST, MID 1993~~
~~T-1 FOR TESTING/EXPEDITING, EARLY 1994~~