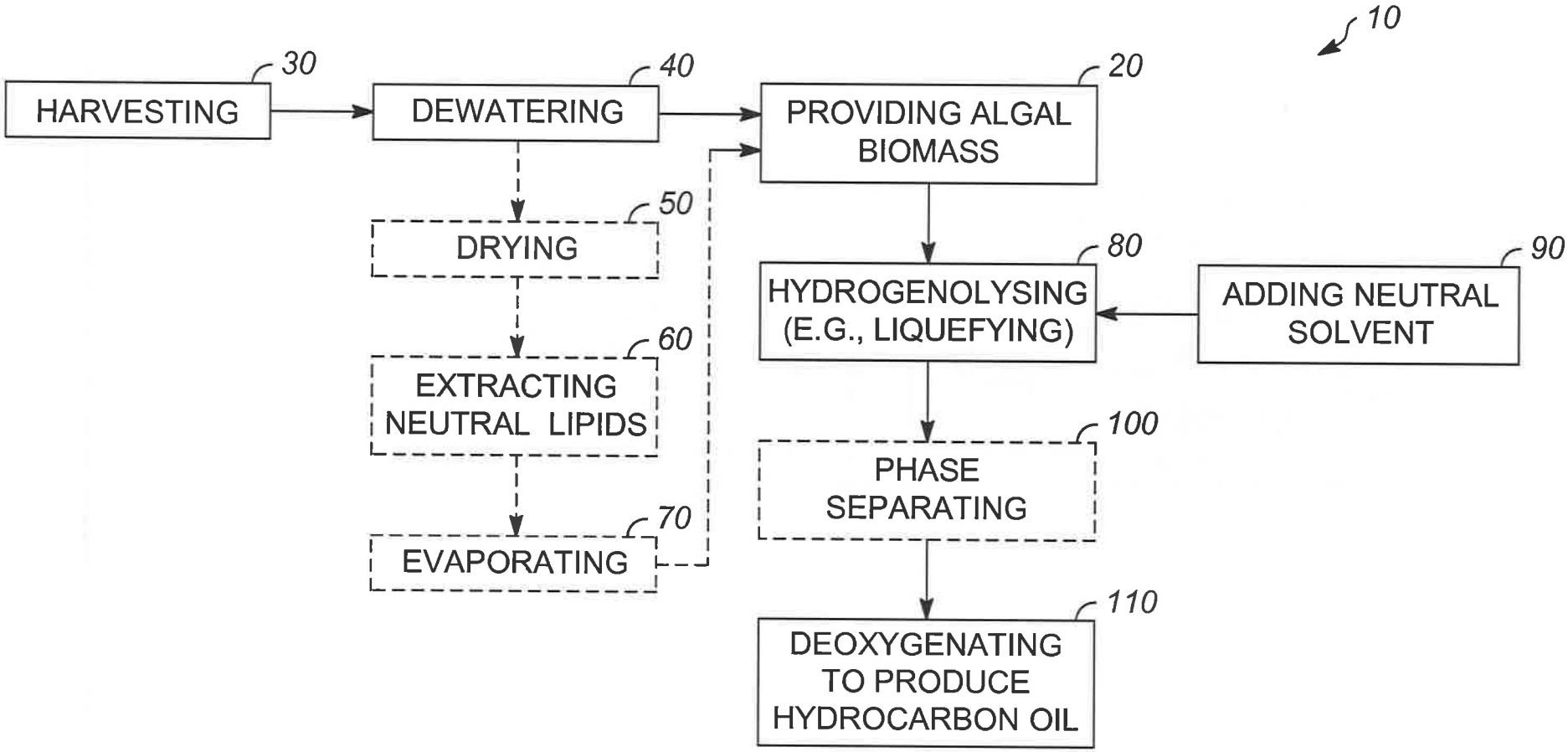

10
30
HARVESTING
40
DEWATERING
20
PROVIDING ALGAL BIOMASS
50
DRYING
80
HYDROGENOLYSING (E.G., LIQUEFYING)
90
ADDING NEUTRAL SOLVENT
60
EXTRACTING NEUTRAL LIPIDS
100
PHASE SEPARATING
70
EVAPORATING
110
DEOXYGENATING TO PRODUCE HYDROCARBON OIL

FIG. 1

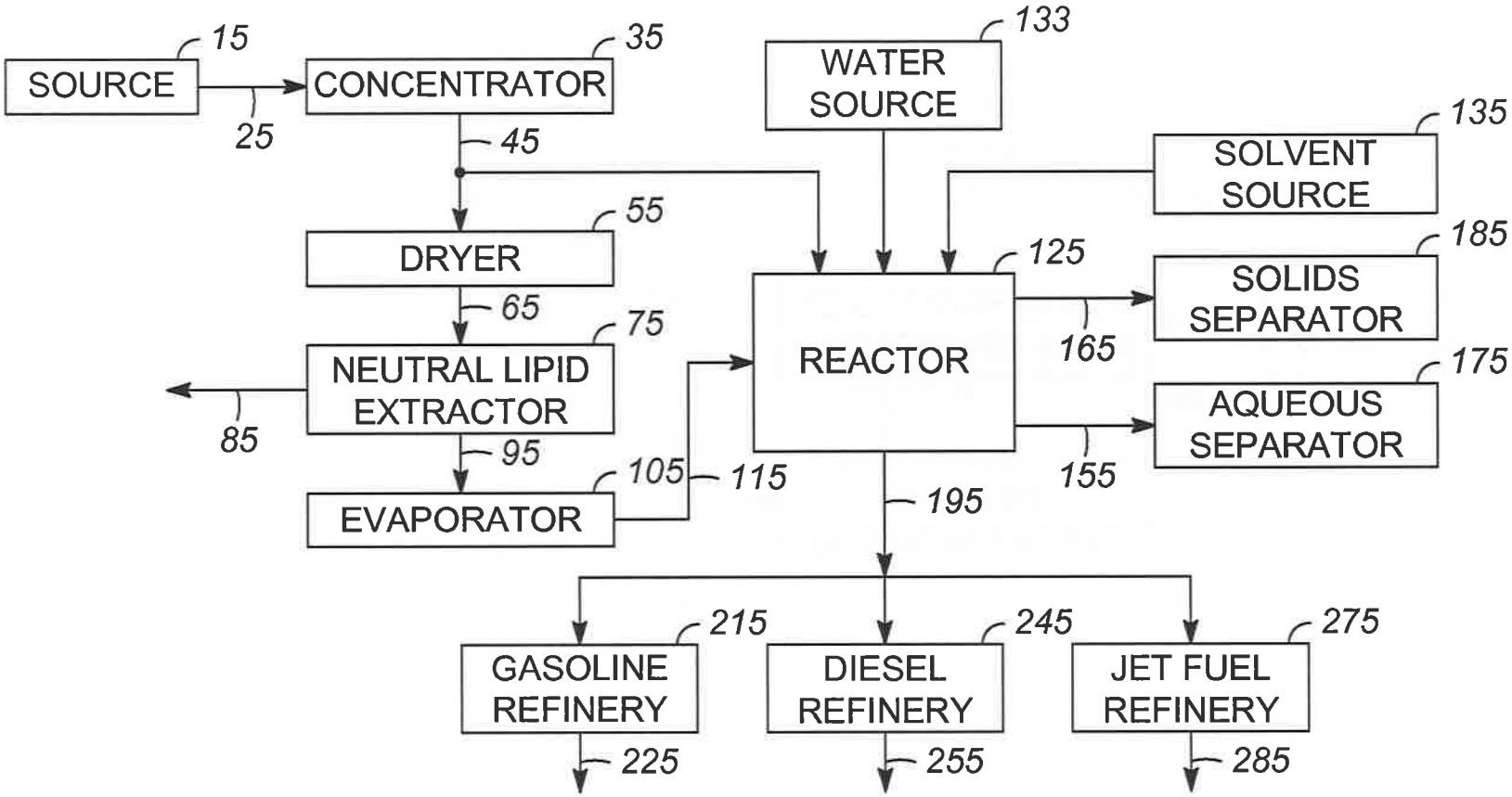

SOURCE
15
25
CONCENTRATOR
35
45
WATER SOURCE
133
SOLVENT SOURCE
135
DRYER
55
65
NEUTRAL LIPID EXTRACTOR
75
85
95
EVAPORATOR
105
115
REACTOR
125
165
155
195
SOLIDS SEPARATOR
185
AQUEOUS SEPARATOR
175
GASOLINE REFINERY
215
225
DIESEL REFINERY
245
255
JET FUEL REFINERY
275
285

FIG. 2

FIG. 3	
FIG. 3A	FIG. 3B

METALS % ON SUPPORTS											
COMBINATION	Ni	Co	Mo	W	Pt	Rd	Rh	Au	Pd	Ir	SUPPORT A
Ni Mo	0.5-5		5-15								GAMMA ALUMINA
Co Mo		0.5-5	5-15								GAMMA ALUMINA
Ni Co Mo	0.1-5	0.5-5	5-15								GAMMA ALUMINA
Ni W	0.5-5			5-20							GAMMA ALUMINA
Pt					0.1-5						GAMMA ALUMINA
Ru						0.1-5					GAMMA ALUMINA
Rh							0.1-5				GAMMA ALUMINA
Au								0.1-5			GAMMA ALUMINA
Pd									0.1-5		GAMMA ALUMINA
Ir										0.1-5	GAMMA ALUMINA
BAUXITE											
RANEY Ni											

FIG. 3A

SUPPORT B	SUPPORT C	SUPPORT D	SUPPORT E	SUPPORT F
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO2	ZrO2	THETA ALUMINA	SILICA ALUMINA
ACTIVATED CARBON	TiO3	ZrO3	THETA ALUMINA	SILICA ALUMINA

FIG. 3B

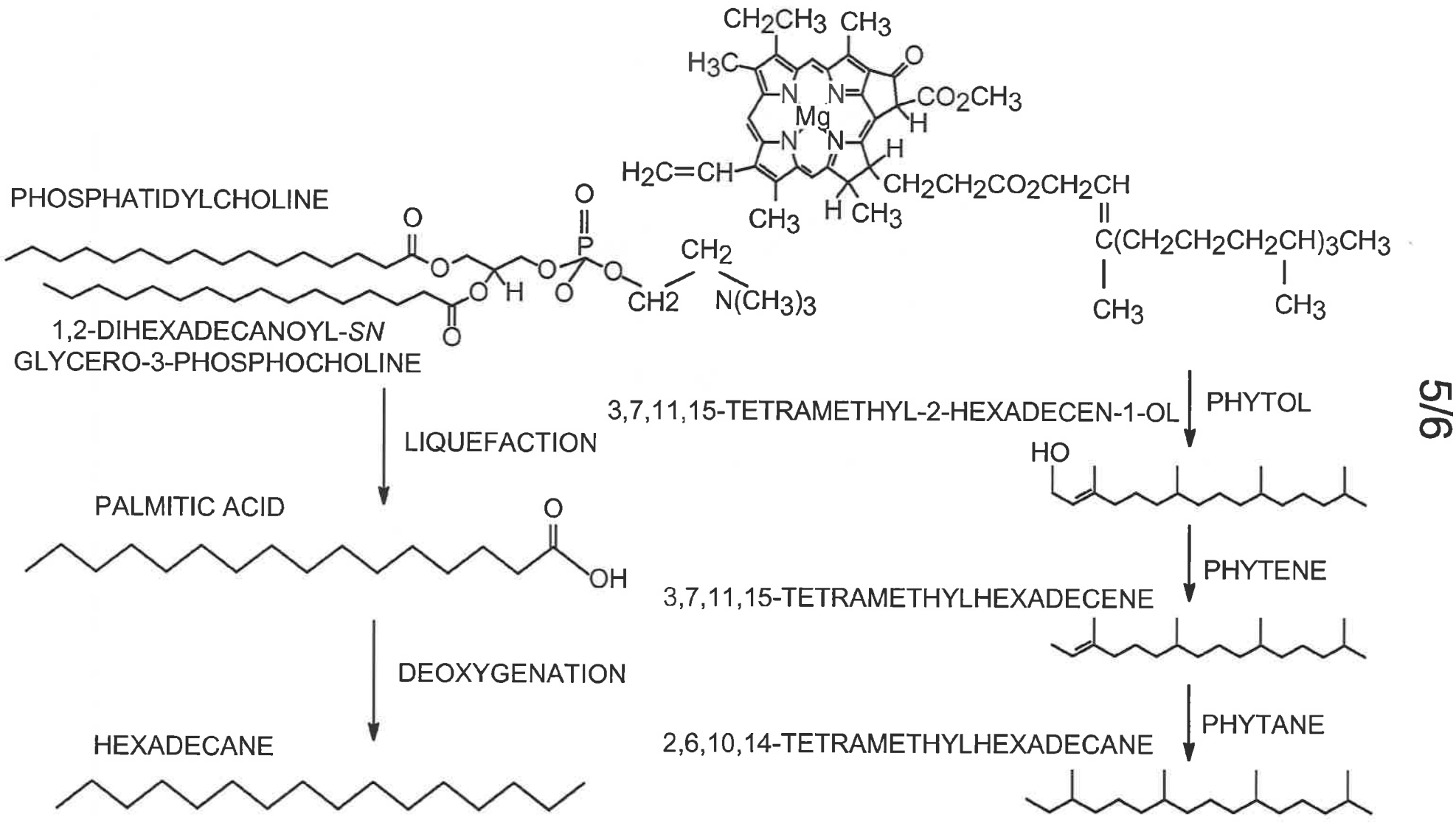

PHOSPHATIDYLCHOLINE
1,2-DIHEXADECANOYL-SN
GLYCERO-3-PHOSPHOCHOLINE
LIQUEFACTION
PALMITIC ACID
DEOXYGENATION
HEXADECANE
3,7,11,15-TETRAMETHYL-2-HEXADECEN-1-OL
PHYTOL
PHYTENE
3,7,11,15-TETRAMETHYLHEXADECENE
PHYTANE
2,6,10,14-TETRAMETHYLHEXADECANE

FIG. 4

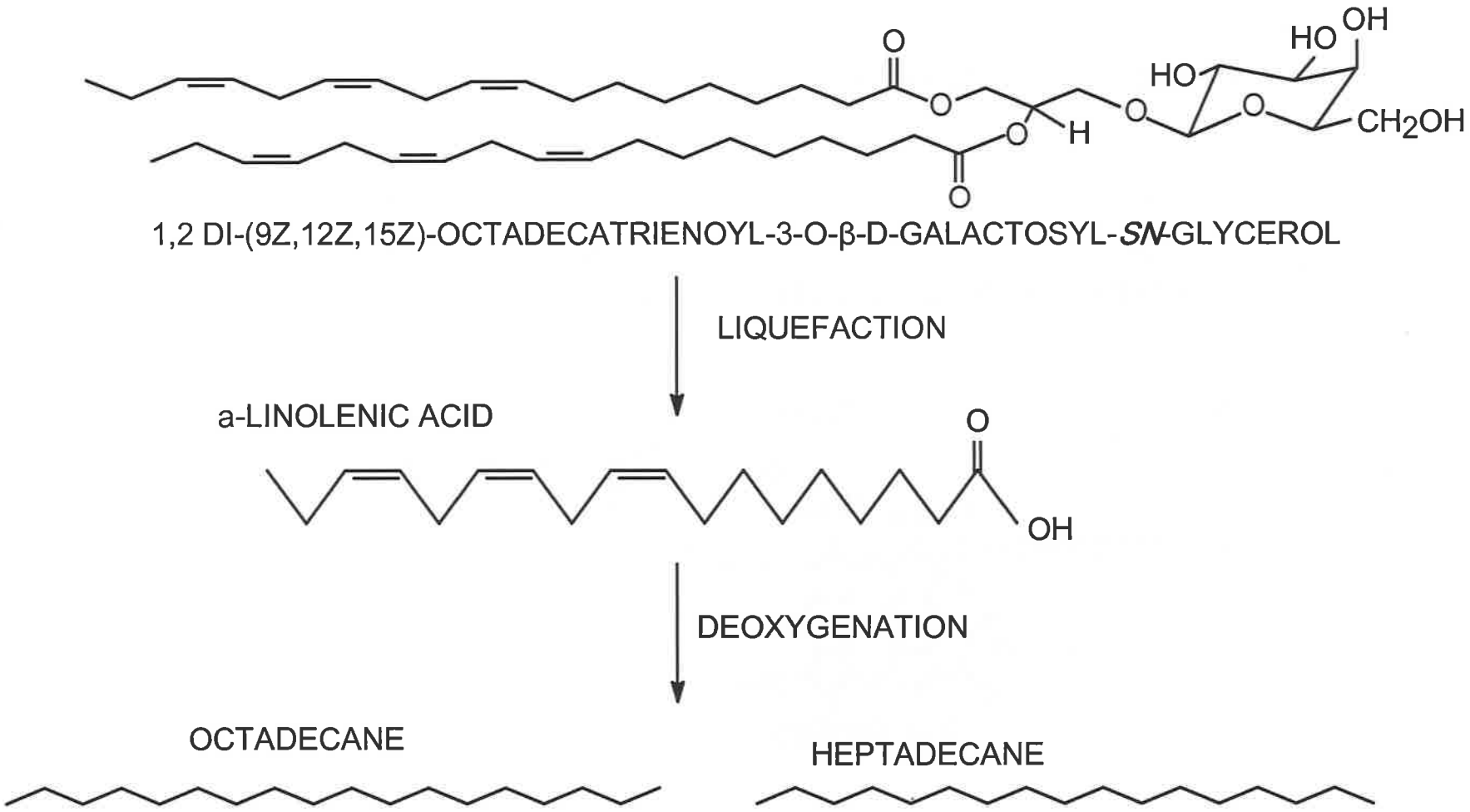

1,2 DI-(9Z,12Z,15Z)-OCTADECATRIENOYL-3-O-β-D-GALACTOSYL-SN-GLYCEROL
LIQUEFACTION
a-LINOLENIC ACID
DEOXYGENATION
OCTADECANE
HEPTADECANE

FIG. 5