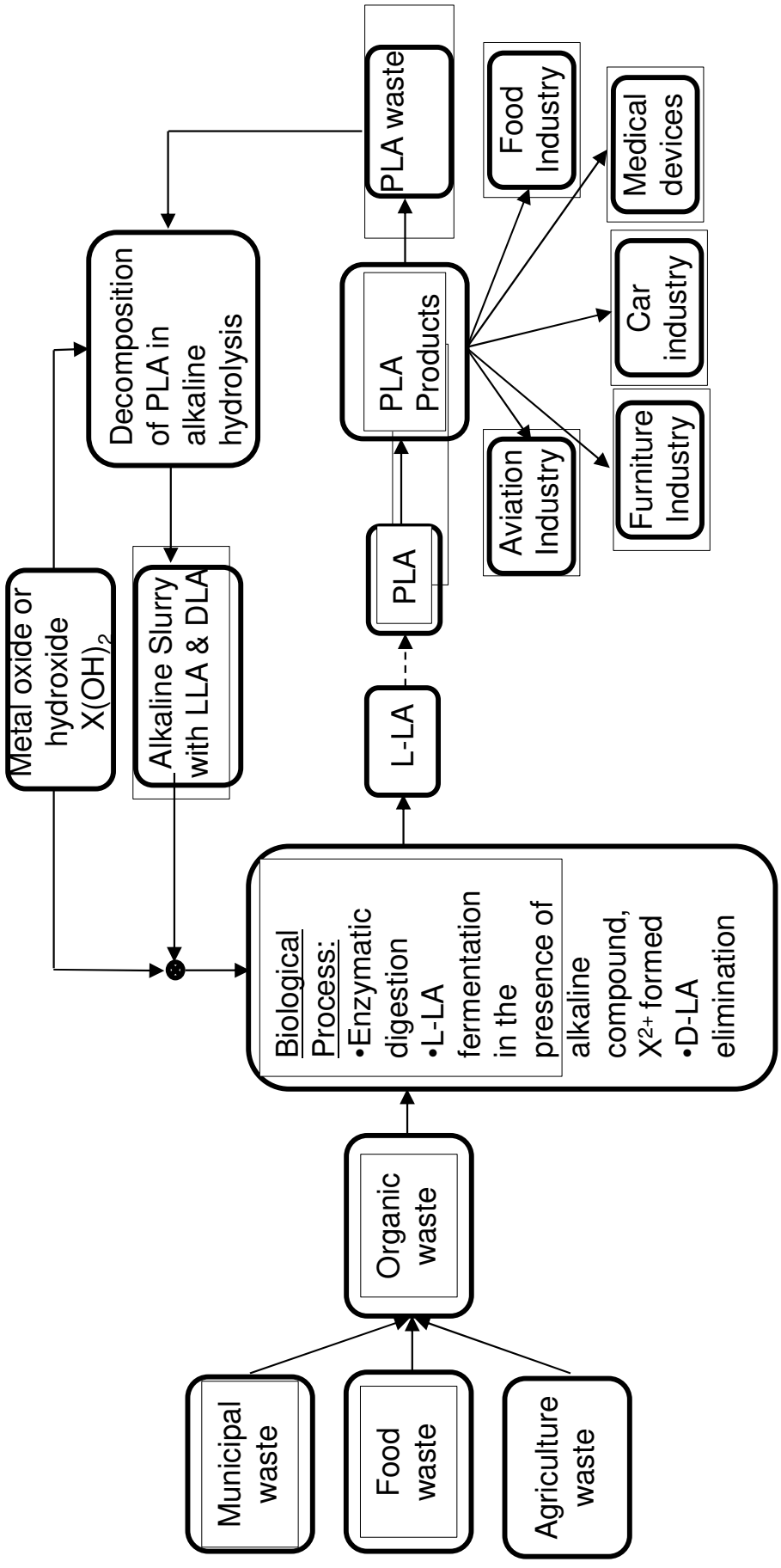
Municipal waste
Food waste
Agriculture waste
Organic waste
Biological Process:
•Enzymatic digestion
•L-LA fermentation in the presence of alkaline compound, X^{2+} formed
•D-LA elimination
L-LA
PLA
PLA Products
PLA waste
Food Industry
Medical devices
Car industry
Furniture Industry
Aviation Industry
Decomposition of PLA in alkaline hydrolysis
Alkaline Slurry with LLA & DLA
Metal oxide or hydroxide $X(OH)_2$

Figure 1

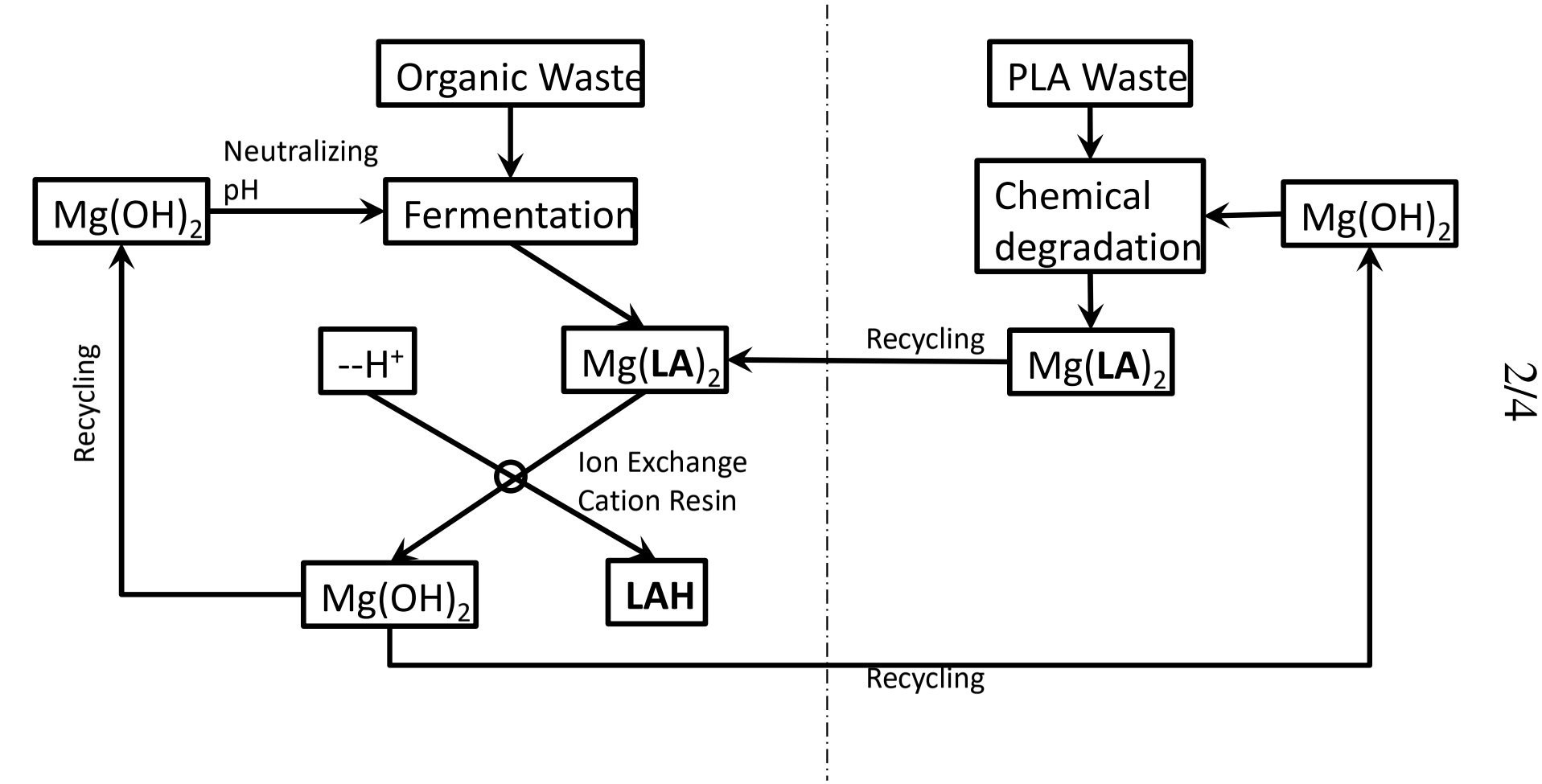
Mg(OH)2
Organic Waste
PLA Waste
Neutralizing
pH
Mg(OH)2
Fermentation
Chemical
degradation
Mg(OH)2
--H+
Mg(LA)2
Recycling
Mg(LA)2
Recycling
Ion Exchange
Cation Resin
Mg(OH)2
LAH
Recycling

Figure 2

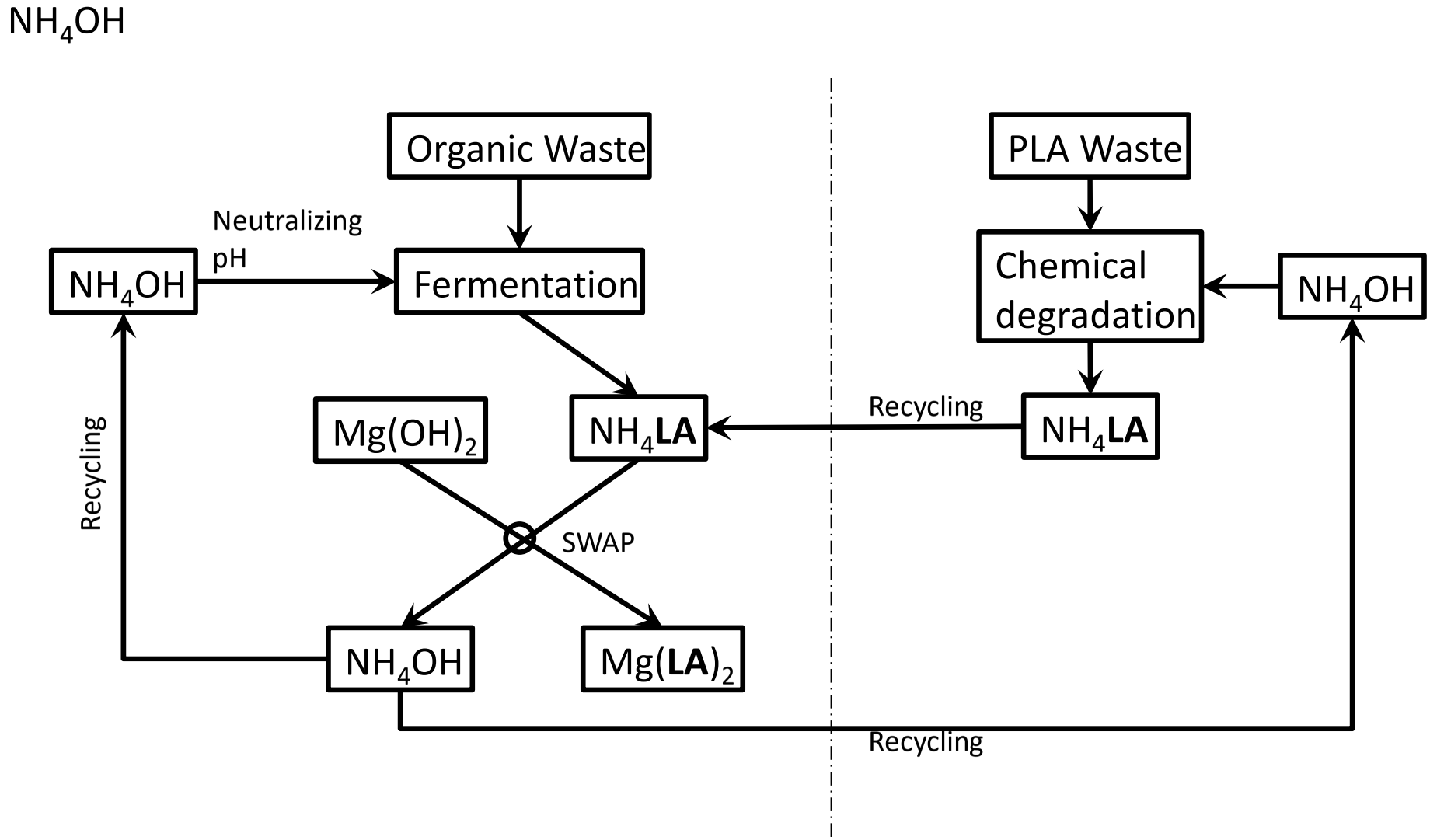
NH4OH
Organic Waste
Neutralizing pH
NH4OH
Fermentation
Mg(OH)2
NH4LA
SWAP
NH4OH
Mg(LA)2
Recycling
PLA Waste
Chemical degradation
NH4OH
Recycling
NH4LA
Recycling

Figure 3

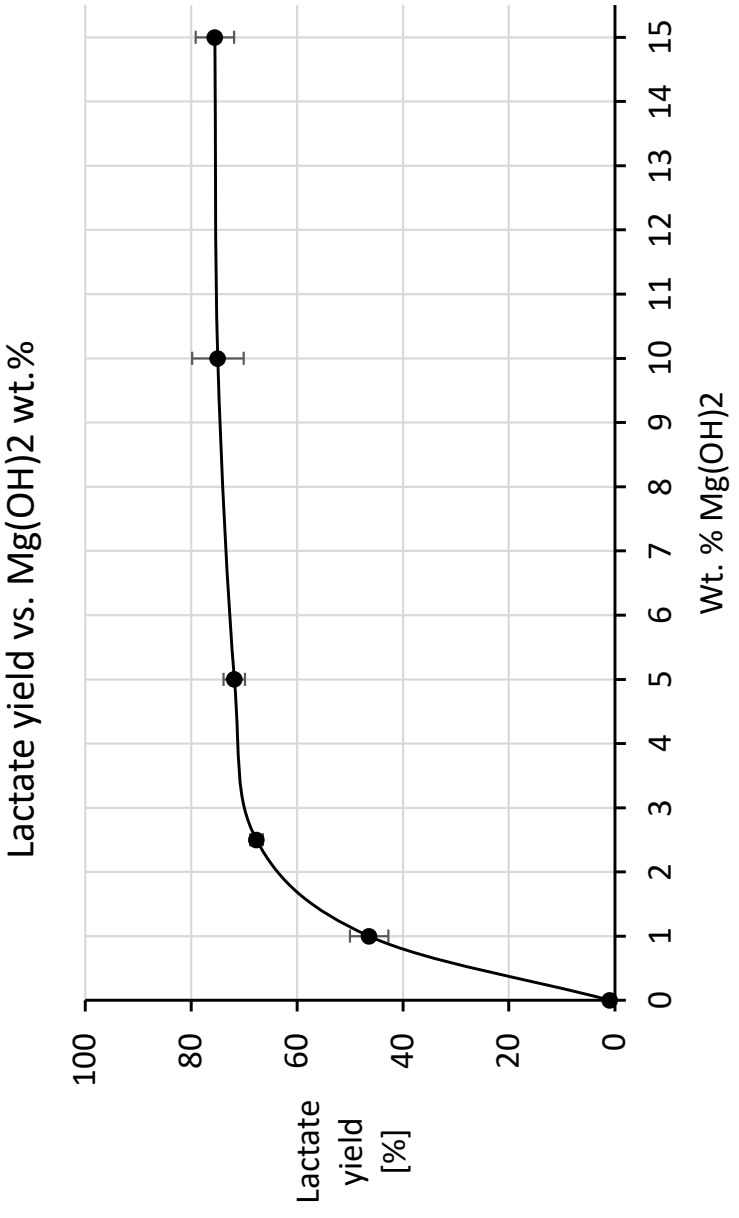
Lactate yield vs. Mg(OH)2 wt.%
Lactate yield [%]
100
80
60
40
20
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Wt. % Mg(OH)2

Figure 4