

Carrier Added Activated Sludge Process: Nitrogen Removal with Entrapping Immobilization Carrier

What is Carrier Added Activated Sludge Process?

When removing nitrogen to prevent eutrophication, conventional activated sludge (CAS) process used to require larger-scale facilities than conventional treatment processes. In carrier added activated sludge process, carriers that flow with activated sludge hold high-density microorganisms (nitrification bacteria) that remove nitrogen. This mechanism enables HRT of nitrogen removal in the nearly equal to that of organic matter removal. JS has developed various kinds of carrier added activated sludge process jointly with private businesses or other public organizations.

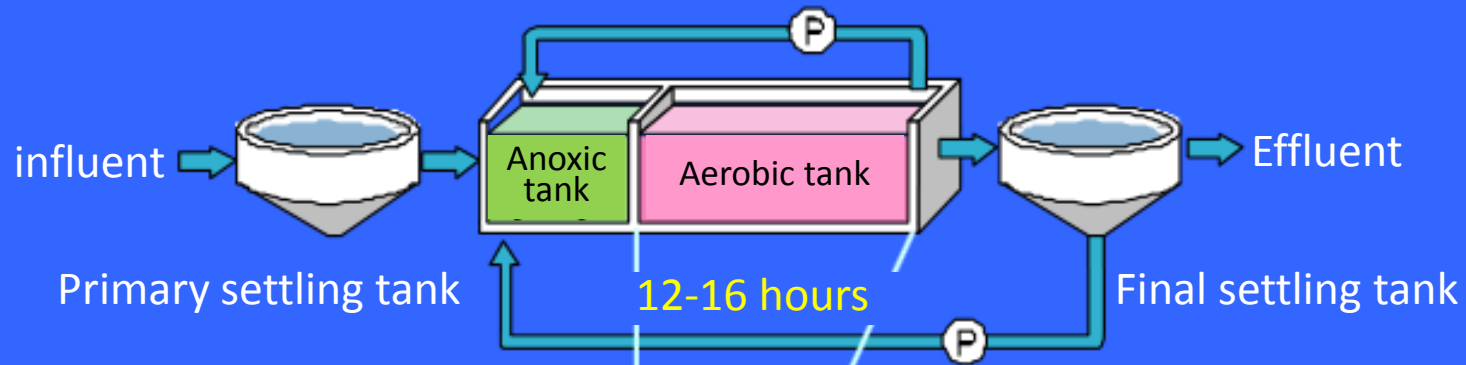
Special Features

- ① Carrier added activated sludge process enables nitrification with a smaller reactor (about a half-capacity) than conventional nitrogen removal technologies.
- ② Thus, the process requires no additional footprint to have nutrients removal capability.
- ③ The process enables common WWTPs to make a nutrients removal by renovating only reactors.
- ④ The process is applicable to various kinds of nutrients removal process.
- ⑤ The process enables stable nitrogen removal even in low water temperature.

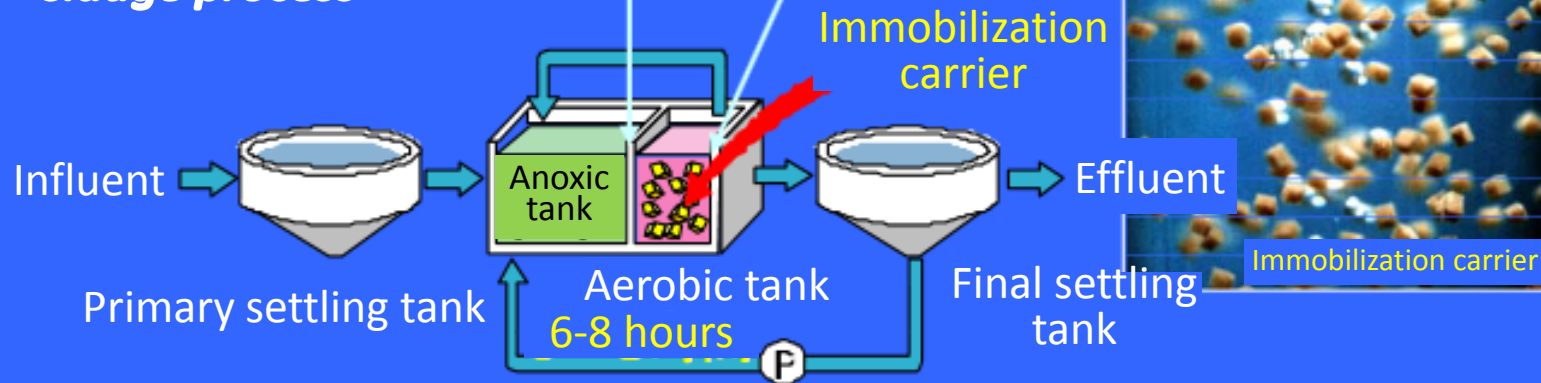
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Process Flow Diagram Comparison

Conventional nutrients removal process (modified Ludzack-Ettinger process)

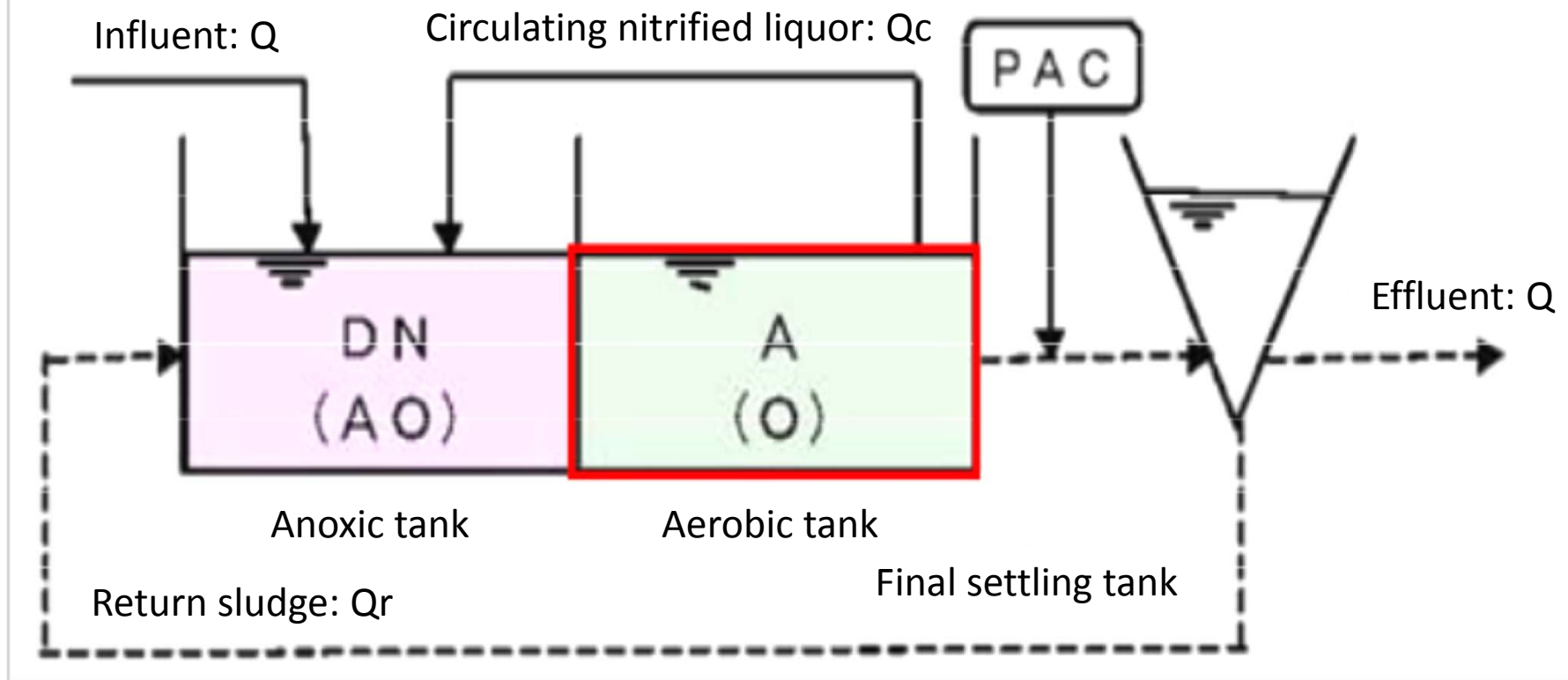


Carrier added activated sludge process



Examples of Application to Nutrients Removal Processes ①

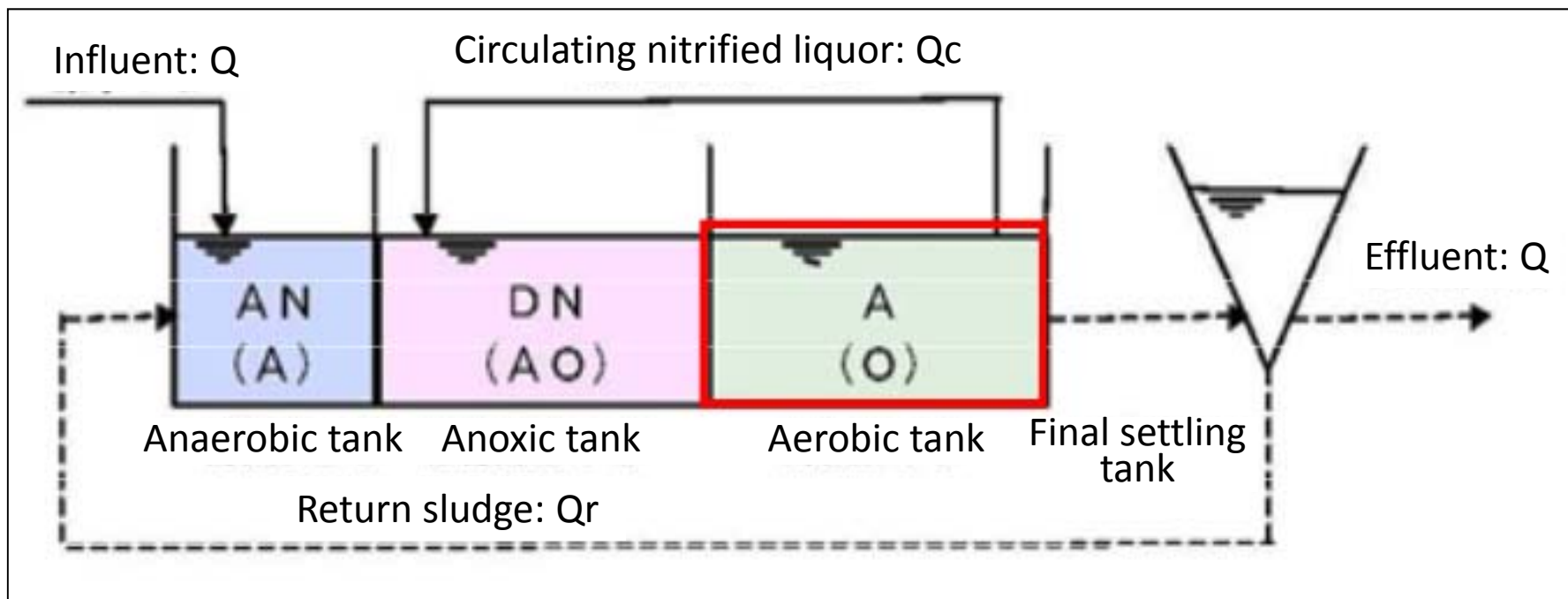
Modified Ludzack-Ettinger process (combination with coagulant)



: Carrier addition tank

Examples of Application to Nutrients Removal Processes ②

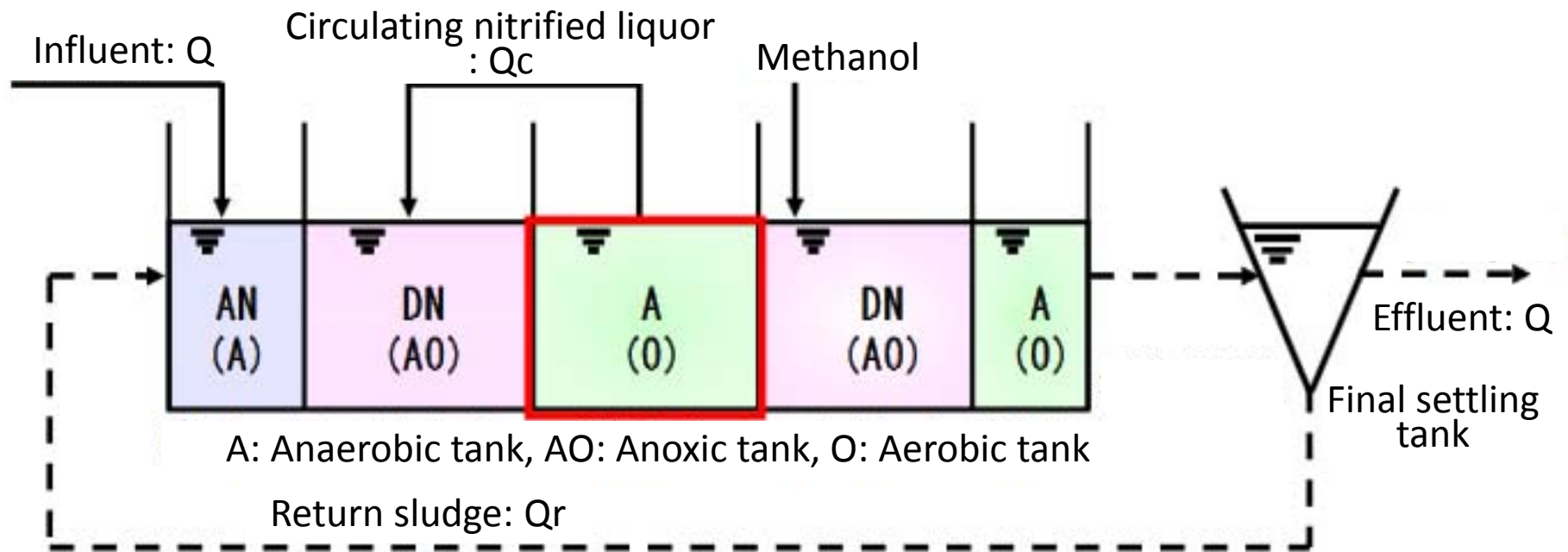
Anaerobic/anoxic/aerobic process



: Carrier addition tank

Examples of Application to Nutrients Removal Processes ③

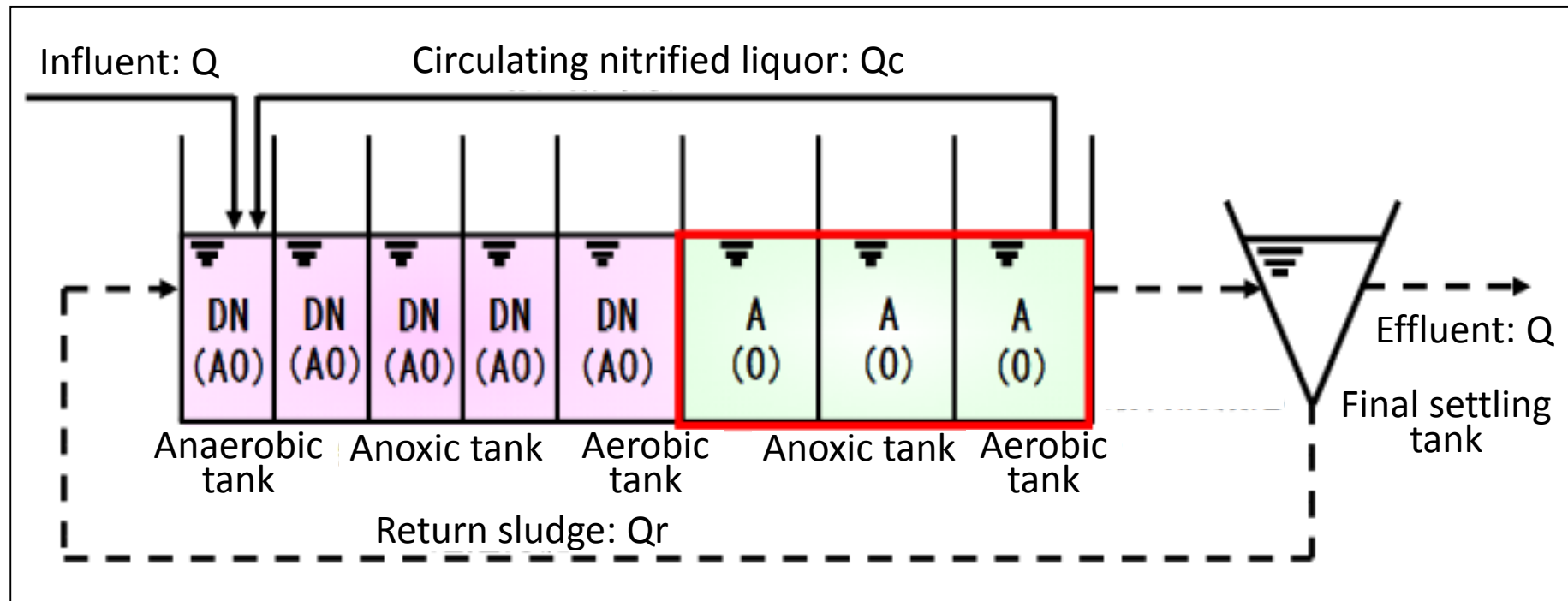
Modified Bardenpho process



 : Carrier addition tank

Examples of Application to Nutrients Removal Processes ④

Modified Ludzack-Ettinger process (large-scale)



: Carrier addition tank

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Application Examples

Mukogawa Downstream WWTP,
Hyogo (2002):
Adsorption Immobilization Carrier

Okubo WWTP, Akashi City, Hyogo (2001):
Covalent binding Immobilization Carrier

Munakata WWTP, Munakata City,
Fukuoka (1995):
Entrapping immobilization carrier



Munakata WWTP

Rikuzentakata WWTP,
Rikuzentakata City,
Iwate (1998):
Entrapping immobilization carrier

