A Development Study on High Quality Drinking Water Production by the Biological Activated Carbon/immersed Membrane Filtration System

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Abstract

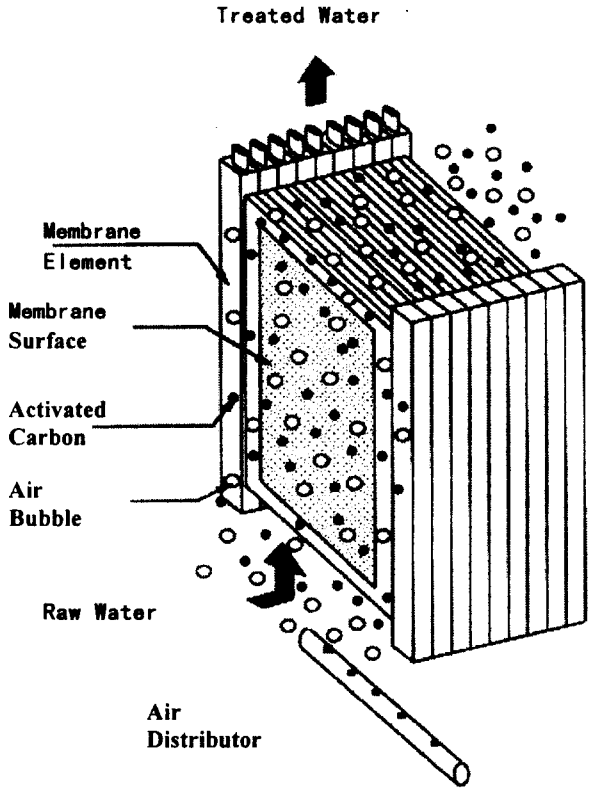
Advanced drinking water production systems, which not only good quality product water, but also provide easy management and maintenance of facilities, and operate on a smaller site area, have been expected to be developed for some time.

We are going ahead with a program to develop an advanced drinking water production system, using immersed membrane filtration combined with biological activated carbon, to meet the needs described above.

The demonstration plant tests have been conducted with surface water from the Yodo-river since Dec. 1998 to measure treatment performance, reliability, and controllability of the system.

The quality of product water has consistently remained at a very high level for about 2 years under controlled conditions. Results showed that the re-circulating granular biological activated carbon could suppress the increase of membrane pressure difference and promote a reduction of dissolved organic matter.

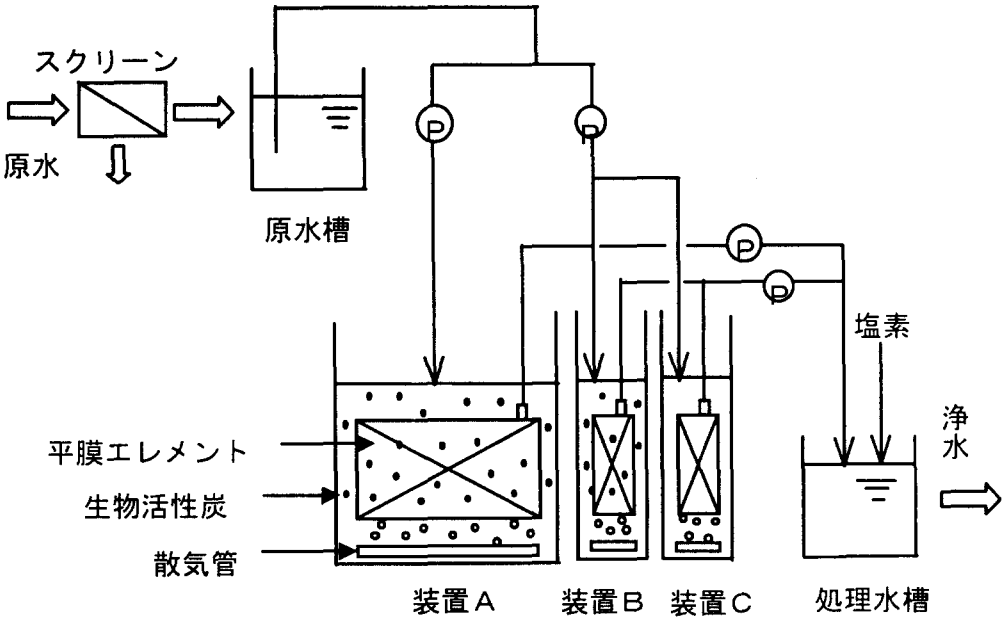
(This work has been conducted along the ACT 21 Programs.)



Expected features:

① **Perfect removal of turbidity and cysts by membrane filtration**
② **High efficient reduction of natural organic matter such as THMFP, and offensive materials such as ammonia and 2-MIB by biological activated carbon**
③ **Simple and compact facility because of the combined process**
④ **Higher stability of membrane flux by physical cleaning action of circulating granular activated carbon**
⑤ **Smaller amount of sludge formation because of no use of coagulant**
⑥ **Easy management of operation because of fewer equipments used**

Image and expected features of the system



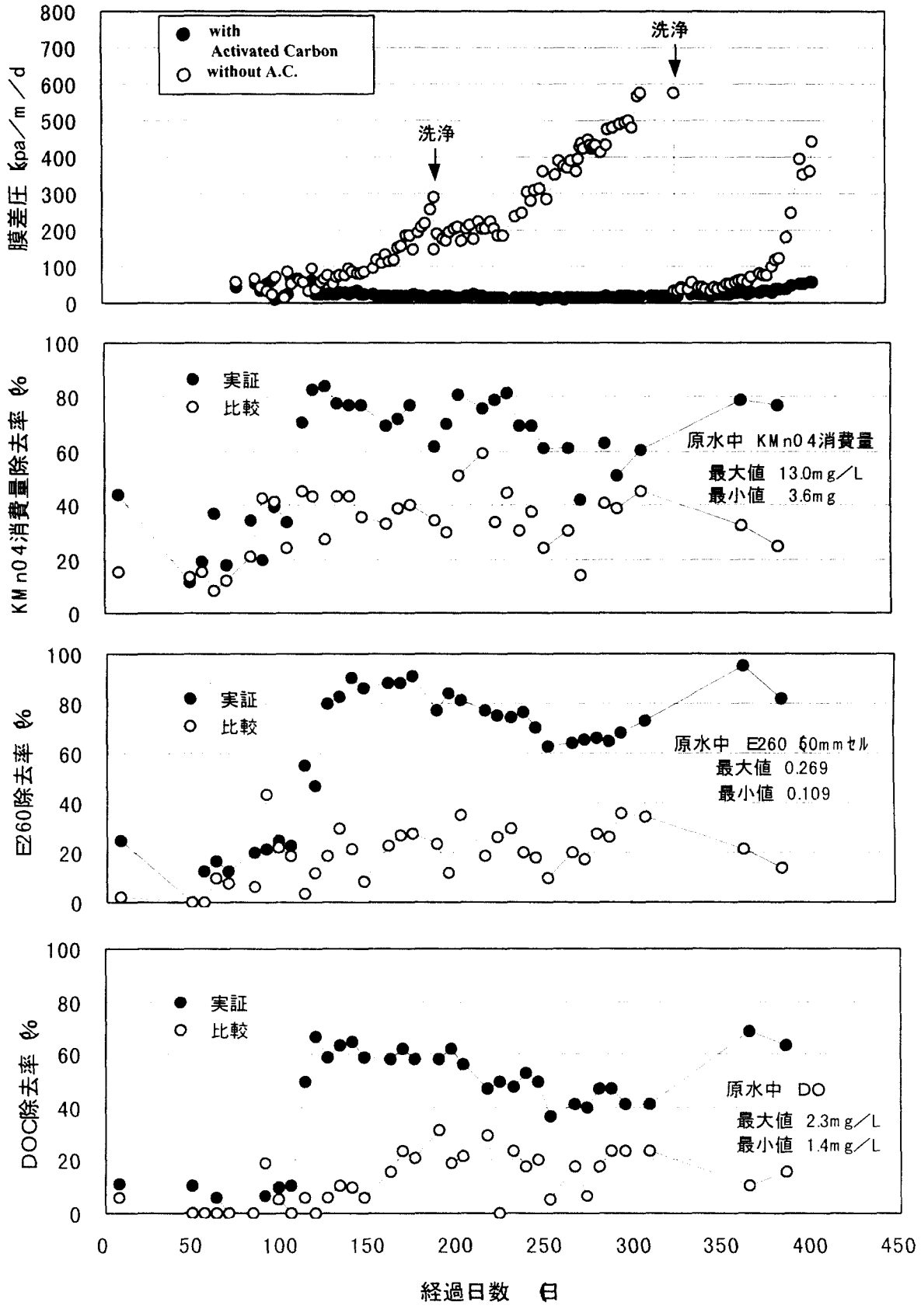
装置A…実証テスト装置（30m³／d）

装置B…要素技術確認テスト装置（3m³／d）

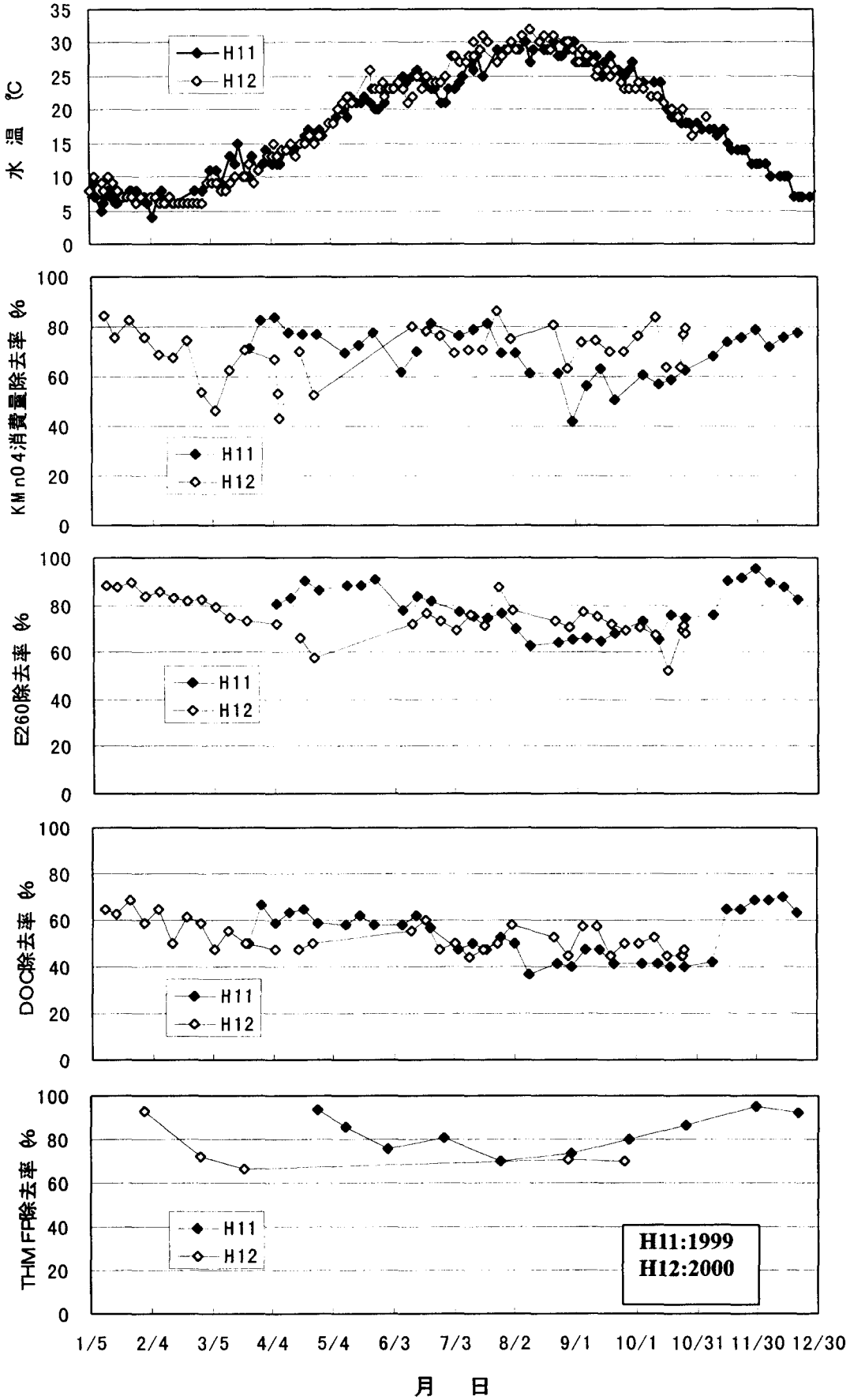
装置C…比較基準テスト装置（3m³／d）

Flow sheet of the demonstration test plant

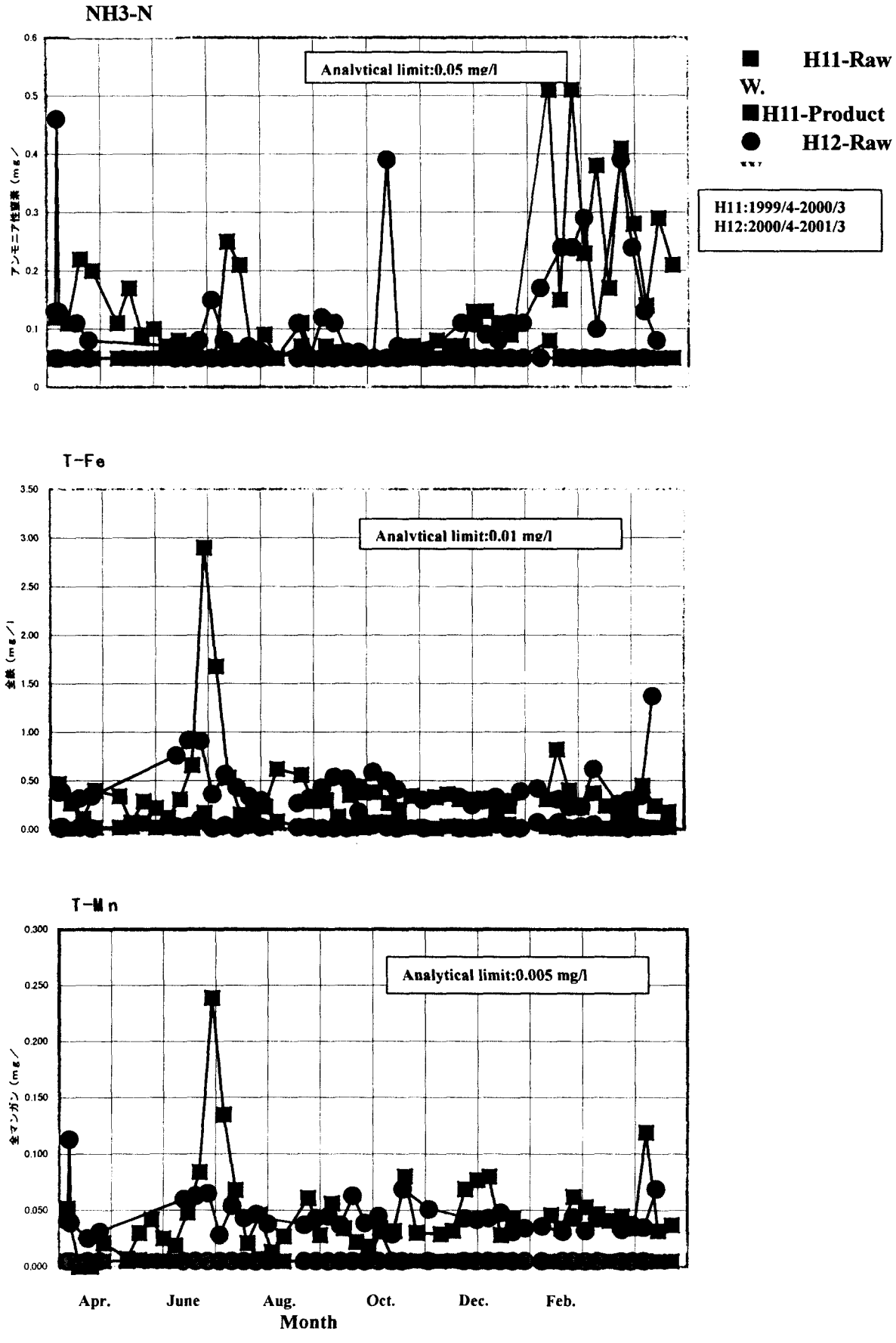
Photo of the installed test plant



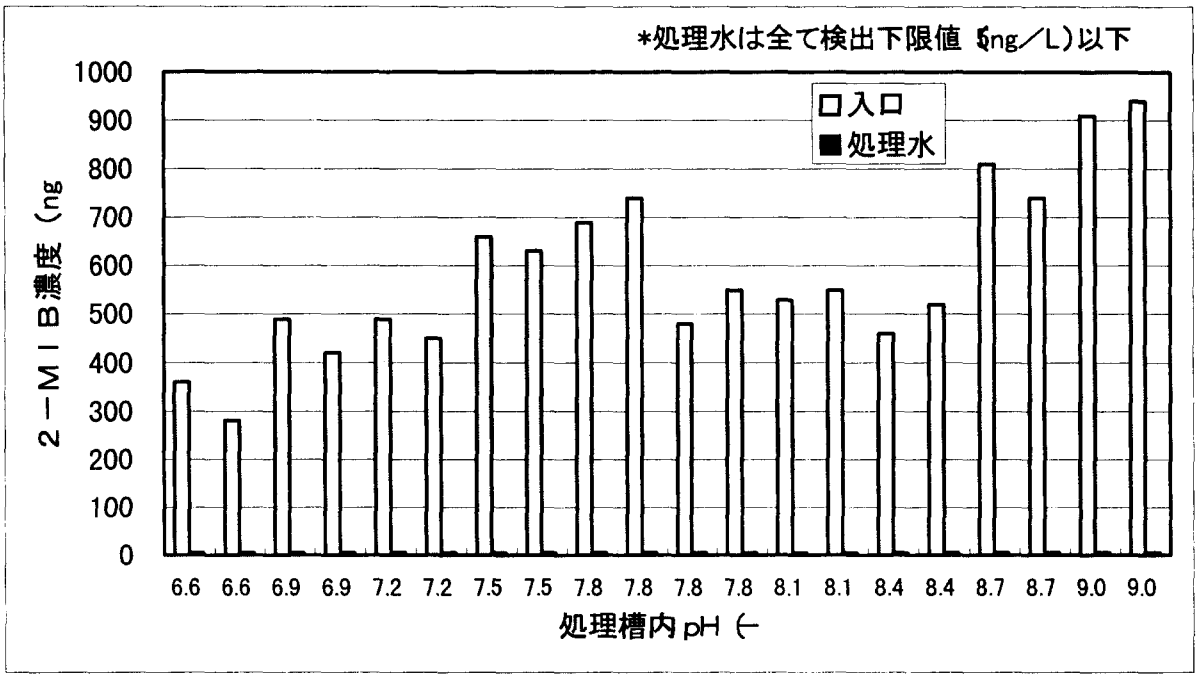
Effects of granular biological activated carbon



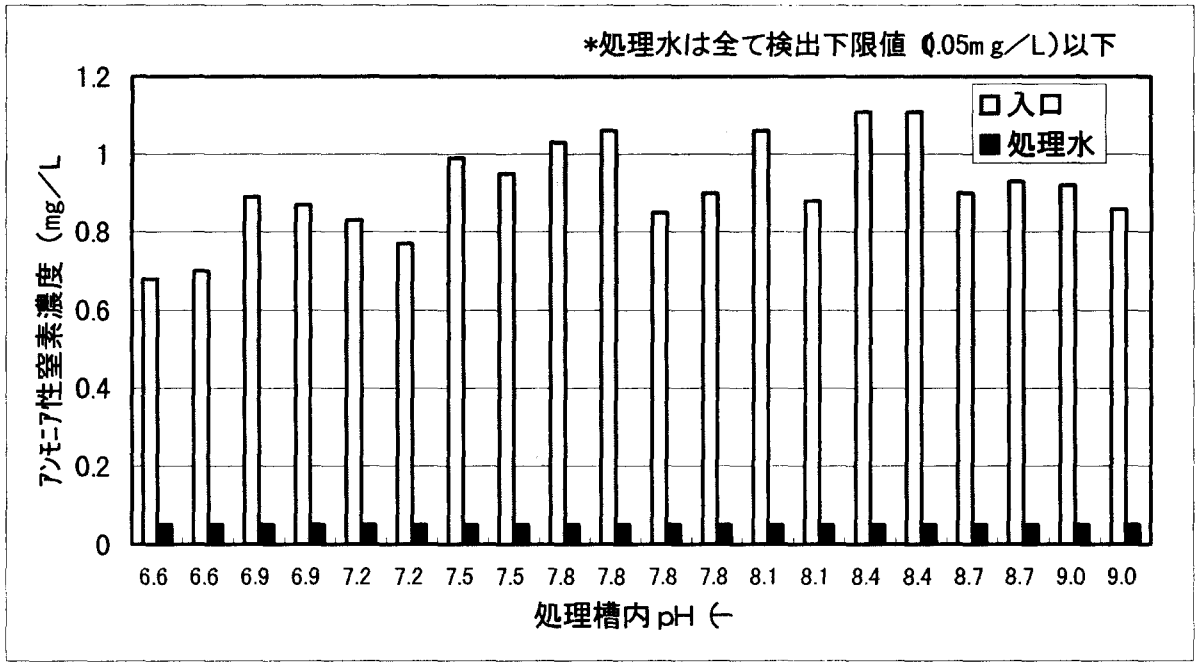
Demonstrated performance of the system for 2 years-(1)



Demonstrated performance of the system for 2 years-(2)



Reduction performance of offensive materials under controlled pH
(1) 2-MIB



Reduction performance of offensive materials under controlled pH
(2) NH_3