

hganji@modares.ac.ir:

// : // :

( ) ABS :

(PBM)  
R2A

(TSI)

(MacConkey agar)  
SIM (SS agar)

(O-F glucose)  
(EMB)

% % :

% / %  
% %

(Proteobacteria)

(Pseudomonas putida)  
:

ABS

- Bigey ) (Watanabe et al. 1987)  
 (et al. 1999; Kobayashi et al. 1992  
 (Wang et al.  
 (Wyatt and Knowles 1995) 2004) (ABS)  
 (Deshkar et al. 2003)
- Wyatt and ) (Deshkar et al. 2003) (Chang et al. 2006)  
 ( Knowles 1995; Wang et al. 2004 ABS  
 (Roach et al. 2004)
- (USEPA)
- : (Leeuwen and Krzyzanowski 2000)
- Li et al. ) /  
 (2007
- (Anoxic) Chekhovskaya 1980; Diane and )  
 (Acidovorax facilis B) (Speece 1991)  
 (Wang et al. 2001) (Pseudomonas nautica)
- ABS  
 (Chang et al. 2006)
- ABS  
 (Wang et al. 2001) AAS6  
 ABS
- (Hu et al. 1998)

(PBM)

( / )

( / ) ( / )

( / )

( / )

)

( ) (

( ) Na<sub>2</sub>MoO<sub>4</sub> ( ) ( )

( )

pH

ABS

/

pH

White )

(et al. 1988; Nawaz et al. 1991

( / )

/

(OD) pH

(

pH OD

Microsoft Excel

Reasoner and) (R2A)

( Geldreich 1995

%

R2A

(Merck-1.00416) R2A

yeast )

%

( / )

( / ) ( extract

(Forbes et al. 2007)

( / )

( / )

( / )

( / )

( / )

( )

( / )

SIM (Merck-1.05470)

(O-F

(MacConkey agar-

glucose)

Merck-1.05465)

(TSI- Merck-1.03915)

PBM

(EMB- Merck-1.01347)

( SS agar- Merck-7667)

(Merck-1.04070)

TSI (PBM)

(Proteobacteria)  
(*Pseudomonas putida*)  
(Forbes et al. 2007)

pH OD<sub>600</sub> pH  
(Pharmacia-LKB-Novaspec II)

pH FID (Varian CP 3800)  
Capillary Column: CP- WAX )  
( 52 CB 25m×0.32mm×1.2μm  
(Cole Parmer)

*P. putida*

% %

OD<sub>600</sub>

pH / / / pH

pH

Li .

% /  
% /

%

(Li et al. 2007)

Wang AAS6

/

OD<sub>600</sub>

/

/

(Wang et al. 2001)

/

/

pH

*P. putida*

*P. putida*

%

%

%

%

OD<sub>600</sub>

*P. putida*

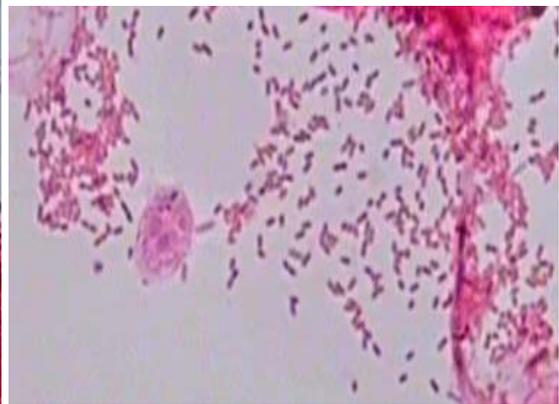
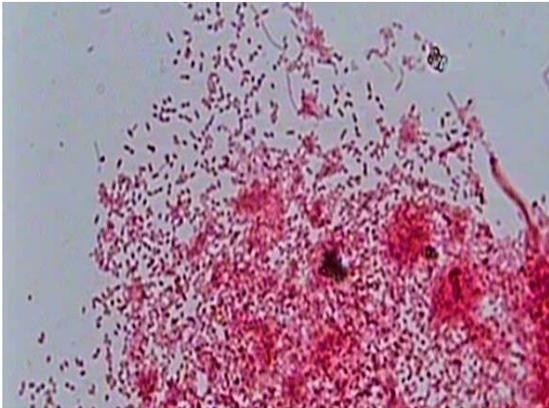
( ) Li pH

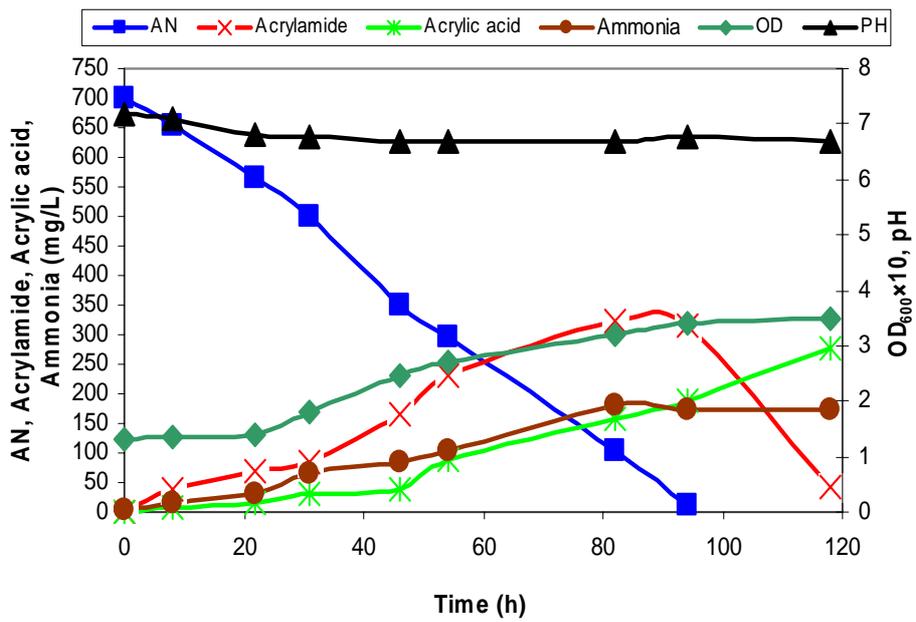
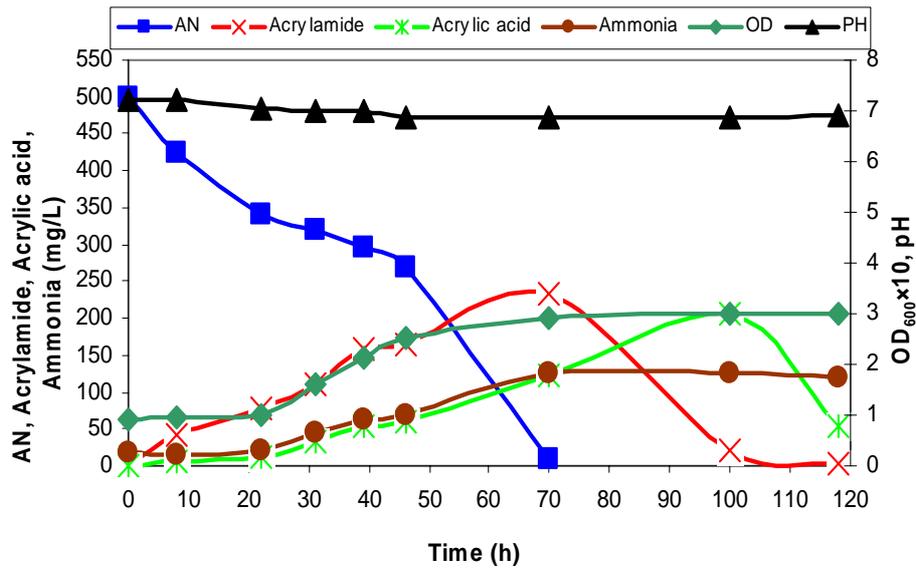
*P.* putida

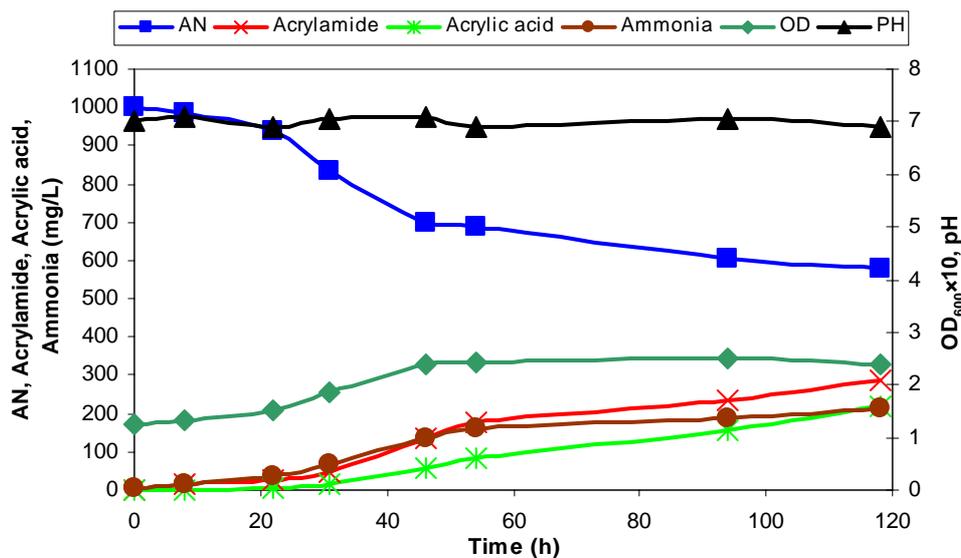
( ) ( Li et al. 2007) Li

( )

(Wang et al. 2004; Shanker et al. 1990)







environmental bacteria and its use in interspecies comparisons and correlations, *Research Journal of Water Pollution Control Federation*. **63**, pp. 198-206.

Forbes, B.A., Sahn, D.F. and Weissfeld, A.S., 2007. Baily and Scott's Diagnostic Microbiology (12th ed.), Elsevier Mosby, Missouri.

Hu, H.Y., Fujie, K., Nozawa, M., Makabe, T. and Urano, K., 1998. Effects of biodegradable substrates and microbial concentration on the acclimation of microbes to acrylonitrile in aerobic submerged biofilter, *Water Science Technology*. **38**(7), pp. 81-89.

Kobayashi, M., Nagasawa, T. and Yamada, H., 1992. Enzymatic synthesis of acrylamide: a success story not yet over, *Trends in Biotechnology*. **10**(11), pp. 402-408.

Leeuwen, F.X.R. and Krzyzanowski, M., 2000. Air Quality Guidelines, WHO Regional publications, European series, (2nd edition), No 91. Copenhagen.

Li, T., Liu, J., Bai, R., Ohandja, D.G. and Wong, F.S., 2007. Biodegradation of organonitriles by adapted activated sludge consortium with acetonitrile-degrading

Bigey, F., Chebrou, H., Fournand, D. and Arnaud, A., 1999. Transcriptional analysis of the nitrile-degrading operon from *Rhodococcus* sp. ACV2 and high level production of recombinant amidase with an *Escherichia coli*-T7 expression system, *Journal of Applied Microbiology*. **86**(5), pp. 752-760.

Chang, C.Y., Chang, J.S., Lin, Y.W., Erdei, L. and Vigneswaran, S., 2006. Quantification of air stripping and biodegradation of organic removal in acrylonitrile-butadiene-styrene (ABS) industry wastewater during submerged membrane bioreactor operation, *Desalination*. **191**, pp. 162-168.

Chekhovskaya, N., 1980. Ambient waste quality criteria: acrylonitrile, USEPA, Washington DC.

Deshkar, A., Dhamorikar, N., Godbole, S., Krishnamurthi, K., Saravanadevi, S., Vijay, R., Kaul, S. and Chakrabarti, T., 2003. Bioremediation of soil contaminated with organic compounds with special reference to acrylonitrile, *Annali di Chimica*. **93**(9-10), pp. 729-737.

Diane, J.W.B. and Speece, R.E., 1991. A database of chemical toxicity to

- bacteria, *Journal of Environmental Science and Health*. **39**(7), pp. 1767-1779.
- Wang, C.C., Lee, C.M. and Cheng, P.W., 2001. Acrylonitrile removal from synthetic wastewater and actual industrial wastewater with high strength nitrogen using a pure bacteria culture, *Water Science Technology*. **43**(2), pp. 349-354.
- Watanabe, I., Satoh, Y. and Enomoto, K., 1987. Screening, isolation and taxonomical properties of microorganisms having acrylonitrile-hydrating activity, *Agricultural and Biological Chemistry*. **51**(12), pp. 3193-3199.
- White, J.M., Jones, D.D., Huang, D. and Gauthier, J.J., 1988. Conversion of cyanide to formate and ammonia by a pseudomonad obtained from industrial wastewater, *Journal of Industrial Microbiology*. **3**, pp. 263-272.
- Wyatt, J.M. and Knowles, C.J., 1995. The development of a novel strategy for the microbial treatment of acrylonitrile effluents, *Biodegradation*. **6**(2), pp. 93-107.
- microorganisms, *Water Research*. **41**, pp. 3465-3473.
- Nawaz, M.S., Franklin, W., Campbell, W.L., Heinze, T.M. and Cerniglia, C.E., 1991. Metabolism of acrylonitrile by *Klebsiella pneumoniae*, *Archives of Microbiology*. **156**(3), pp. 231-238.
- Reasoner, D.J. and Geldreich, E.E., 1995. A new medium for the enumeration and subculture of bacteria from potable water, *Applied and environmental Microbiology*. **49**(1), pp. 1-7.
- Roach, P.C., Ramsden, D.K., Hughes, J. and Williams, P., 2004. Biocatalytic scrubbing of gaseous acrylonitrile using *Rhodococcus ruber* immobilized in synthetic silicone polymer (ImmobaSil) rings, *Biotechnology and Bioengineering*. **85**(4), pp. 450-455.
- Shanker, R., Ramakrishna, C. and Seth, P.K., 1990. Microbial degradation of acrylamide monomer, *Archives of Microbiology*. **154**, pp. 192-198.
- Wang, C.C., Lee, C.M. and Chen, L.J., 2004. Removal of nitriles from synthetic wastewater by acrylonitrile utilizing