

// ()
 // , ,

*

:

:

g

- *ppm*

- *ηm*

(*Pearson*)

:

- *ppm*

- *ηm*

/ /

(*r*²) *Pearson*

% / - / % / - /

%CV

±

/ - / *mg/m*³

:

:

mrazari@hotmail.com :

()
National Institute of Occupational (Metal Working Fluids)
Health and Safety (NIOSH)

/ .
()
()
NIOSH
NIOSH
cellulose mixed cellulose (C₁₀-C₁₈)

Fourier Transform Infrared
Spectrometry
/ /
()
()
NIOSH

/ .
()
NIOSH
()

ACGIH American Conference of
Governmental Industrial Hygienists (ACGIH)
mg/m³

()
ACGIH (-)

/					
/ - / Lit/min					
- Lit					
(°C)					
(Cecil CE 2021)					
- ppm		Merck (%) n-petane:			
•		mixed cellulose ester (MCE)			
		/		mm	
				SKC	
()				•	
) Pearson					
(					
(Coefficient of Variation)					
- ppm		g			
nm		ppm		/ -	
				) - µl	
				(/ g/ml	
				ppm	
				(°C)	
				ml	
				- ppm	
				•	
- ppm				SKC	
y=0.0245χ+0.1904		y=0.0213χ+0.4632		(open face filter holder)	
Pearson		y=0.018χ+0.633		MCE	
/ / /				/ µm	
				mm	
.()				µm	
				Poly Vinyl Chloride	

-	ppm	-
P	r ²	$\lambda_{\max}$ nm
< /	/	MWFs
< /	/	
< /	/	

ppm

/ - /

- ppm

.()

mmHg

°C

±

- ppm

/ - / mg/m³

ppm

ppm

/ - /

-

%CV	%CV	ppm	MWFs
/	/		
/	/		
/	/		
/	/		
/	/		
/	/		
/	/		
/	/		
/	/		
/	/		

()

/ - /

Pearson

		NIOSH	
NIOSH			()
	()		
		NIOSH ACGIH	
		/ /	
		NIOSH	.()
	/ /		
.()	NIOSH	NIOSH	()
		NIOSH	/ /
	.()		.()
		(Fourier Transform Infrared Spectrometry)	
		(Ultra Violet &Visible Spectrometry)	
	.()		
		NIOSH	
		.()	NIOSH
		- ηm	°C

REFERENCES

1. Saori U, Yuko S, Kozo Y. Metal working fluid hand dermatitis. Ind Health 2002; 40: 291-3.
2. Misra SK, Sköld Rolf O. Lubrication studies of aqueous mixtures of inversely soluble components. Colloids Surf A Physicochem Eng Asp 2000; 170(2-3):91-106.

3. Kennedy S, Chan-Yeung M, Teschke K, Karlen B. Change in airway responsiveness among apprentices exposed to metal working fluids. *Am J Respir Crit Care Med* 1999; 159: 87-93.
4. Lee K, Agazadeh F, Hatipharasulu S, Ray TG. Health risk from metal working fluids in machining and grinding operations. *Int J Occup Safe Ergon (JOSE)* 2003; 9(1):75-95.
5. Bukowski J. Review of respiratory morbidity from exposure to mineral-oil mists. American Conference of Governmental Industrial Hygienists 2004; Cincinnati, Ohio.
6. Ameille J. Work related asthma and respiratory systems among workers exposed to metal working fluids. *Am J Ind Med* 1995; 27:247-56.
7. Greaves IA, Eisen EA, Smith TJ, Pothier LJ, Kriebel D, Woskie SR, et al. Respiratory health of automobile workers exposed to metal working fluids. *Am J Ind Med* 1997; 32(5):450-9.
8. Kennedy S.M. et al. Pulmonary responses among automobile workers exposed to aerosols of machining fluids. *Am J Ind Med* 1989; 15: 627-41.
9. American Conference of Governmental Industrial Hygienists. TLVs and BEIs based on the documentation of the threshold Limit Values for chemicals substances and physical agents and biological exposure indices. 2007; Cincinnati, Ohio.
10. NIOSH. What you need to know about metal working fluids. U.S. department of health and human services public health service centers for disease control and prevention national institute for occupational safety and health. DHHS (NIOSH) 1998; Publication No. 98-116.
11. NIOSH Manual of Analytical Methods (NMAM). Oil Mist, Mineral: Method 5026: (NIOSH) 194; Publication No. 94-113.
12. NIOSH Manual of Analytical Methods (NMAM), Fourth Edition. Metal working fluids (MWFs) all categories. Method: 5524 (NIOSH) 2003; issue 1.
13. Rae CNR. UV-VIS Spectroscopy. New York: Plenum Press. 1967; Chaps 2-6.
14. Bauman RP. Absorption spectroscopy. New York: John Wiley & Sons. 1962; Chaps 6 & 8.
15. Hee Q, Shane S. Hazardous waste analysis. Direct reading instrument methods. Maryland: Government Institute: a division of ABS Group Inc. 1999; Chap 19.
16. Material Safety Data Sheet. Pentane (online), Last updated 1997. Available from: URL:<http://www.siri.org/msds/tox/f/q86/q713.html>
17. Simpson AL. Comparison of methods for the measurement of mist and vapor from light mineral oil-based metalworking fluids. *Appl Occup Environ Hyg* 2003; 18(11): 865-76.
18. Simpson AL, Groves JA, Unwin J, Piney M. Mineral oil metal working fluids (MWFs) development of practical criteria for mist sampling. *Ann Occup Hyg* 2000; 44(3): 165-72.