9) Which of the above rules can be illustrated by the given data?

Question:

Which of the partitioning rules can be illustrated by the partition data given below?

Hint: first classify all compounds according to the scheme (page "Polarity" or Table 3 in the textbook) as apolar, monopolar (H-donor or acceptor) and bipolar!

Compound / solvent combination	**$K_{solvent/air}$**	**Example for partitioning rule ...**					
		I only vdW-interactions occur:			**II** also H-bond interactions occur:		
		Rule 1 Case Ia apolar molecules in apolar or monopolar phases	**Rule 2** Case Ib monopolar molecules in monopolar phases of the same polarity and in apolar phases	**Rule 3** Case Ic bipolar molecules in apolar phases	**Rule 4** Case IIa apolar molecule in bipolar phases	**Rule 5** Case IIb >various chemicals in monopolar phases	**Rule 6** other cases
ethanol / decane	38			✓			
ethanol / CCl_4	115			✓			
ethanol / cyclohexane	45			✓			
butanone / cyclohexane	1301		✓				
butanone / butylether	533		✓				
butanone / CH_2Cl_2	7272		✓				
dioxane / CCl_4	4326		✓				
dioxane / cyclohexane	1106		✓				
dioxane / ethyl ether	2436		✓				

dioxane / chloroform	27366					✓	
dioxane / CH_2Cl_2	18712					✓	
		Rule 1 **Case Ia** apolar molecules in apolar or monopolar phases	**Rule 2** **Case Ib** monopolar molecules in monopolar phases of the same polarity and in apolar phases	**Rule 3** **Case Ic** bipolar molecules in apolar phases	**Rule 4** **Case IIa** apolar molecule in bipolar phases	**Rule 5** **Case IIb** various chemicals in monopolar phases	**Rule 6** **other cases**
toluene / CCl_4	6621		✓				
toluene / decane	2638		✓				
toluene /cyclohexane	3831		✓				
dioxane / decane	813		✓				
dioxane / CCl_4	4326		✓				
dioxane /cyclohexane	1106		✓				
dioxane / toluene	4080		✓				
dioxane /diethyl ether	2436		✓				
dioxane / benzylether	3122		✓				
butanone / decane	254		✓				
butanone / cyclohexane	1301		✓				
butanone / butylether	533		✓				
butanone / benzylether	985		✓				
		Rule 1 **Case Ia** apolar molecules in	**Rule 2** **Case Ib** monopolar molecules in	**Rule 3** **Case Ic** bipolar molecules in	**Rule 4** **Case IIa** apolar molecule in	**Rule 5** **Case IIb** various chemicals in	**Rule 6** **other cases**

		apolar or monopolar phases	monopolar phases of the same polarity and in apolar phases	apolar phases	bipolar phases	monopolar phases	
water / heptane	4.47			✓			
water / 1,2,4-trichlorobenzene	12.5			✓			
water / tetrachloroethylene	6.67			✓			
ethanol / decane	38			✓			
ethanol / cyclohexane	45			✓			
ethanol / benzene	229						✓
ethanol / isopropylether	470						✓
ethanol / dioxane	1922						✓
toluene / butyl ether	3780		✓				
toluene / heptane	2928		✓				
toluene / chloroform	11890					✓	
octane / decane	6688	✓					
octane / CCl_4	11142	✓					
octane /cyclohexane	11227	✓					
octane / toluene	7387	✓					
octane / ethyl ether	8287	✓					

proceed to answer