A new approach of the calculation of combustion enthalpies of three-coordinated phosphorus, arsenic, antimony, and bismuth organic derivatives in the condensed state on the basis of 4-th equations \( \Delta H_{\text{comb}} = f(a,b,N) \) in which \( a \) and \( b \) are constants and \( N \) is a number of valent, bond-forming electrons in the researching molecules. The formation enthalpies of liquid and solid phosphorus and arsenic derivatives (9 compounds) accordingly to the above mentioned equation and Hess-low have been calculated. The gaseous formation heats (in kJ/mol), receiving on the basis two- and six-atomic alcohols (derivatives of diols, ribite and D-mannite), received with account of their vaporization enthalpies. The last includes the solvation topological index of the first order and quadrant of dipole moment of molecules.